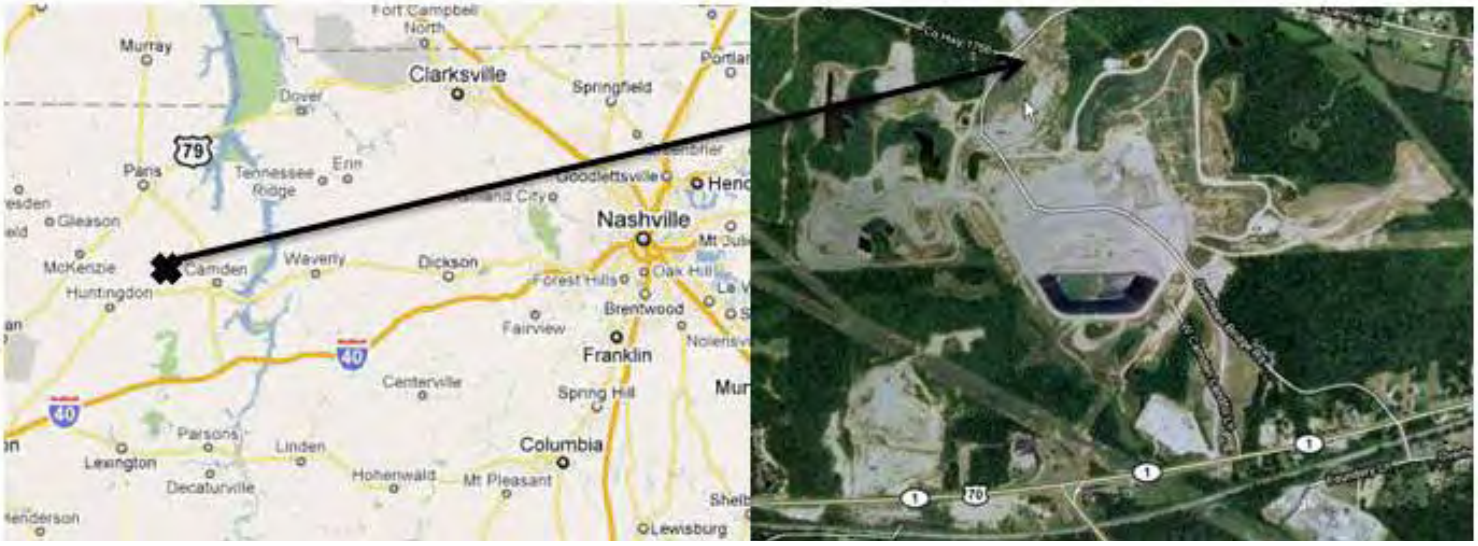
## Attachment 1 - Location and Vicinity



# Construction Application for Three Reciprocating Engines

Waste Management, Inc.
West Camden Sanitary Landfill
Camden, Tennessee

April 2010

*Delivering sustainable solutions in a more competitive world*

ERM

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# 1.0 INTRODUCTION

## 1.1 FACILITY INFORMATION

The West Camden Sanitary Landfill (the facility) is located in Camden, Tennessee. Currently, 162 acres of the landfill facility are permitted for solid waste disposal. The facility operates under Title V Permit No. 548537.[1] In 1992, the facility had a design capacity to handle above 2.5 million Mg of trash and had a trash storage volume in excess of 2.5 million cubic meters. Therefore, the West Camden facility is subject to Federal NSPS requirements of 40 CFR Part 60, Subpart WWW. Since the landfill reached the threshold capacity after the EPA effective date of May 30, 1991, the landfill is not considered an existing landfill. The landfill has been operating a gas collection and control system (GCCS) in accordance with Subpart WWW since 1997, after non-methane organic compound (NMOC) emissions were calculated to exceed 50 Mg per year.

The facility is also subject to Federal MACT requirements of 40 CFR Part 63, Subpart AAAA: National Emission Standards for Hazardous Air Pollutants, Municipal Solid Waste Landfills. The facility is not currently a major hazardous air pollutant (HAP) facility nor will the facility be a major HAP facility after construction of the proposed process, but is subject to these requirements because of having a NSPS WWW required gas system.

## 1.2 APPLICATION PURPOSE

This permit application is for the construction of a new landfill gas (LFG), LFG-to-energy (LFGTE) facility[2] consisting of (3) internal combustion (IC) engines and electrical generator sets that will be fueled solely by landfill gas generated from the landfill. The facility will be located within the West Camden landfill property boundaries.

Methane ($CH_4$ ) and $CO_2$ are the primary constituents of landfill gas, and are produced by microorganisms within the landfill under anaerobic conditions. Transformations of $CH_4$ and $CO_2$ are mediated by microbial populations that are adapted to the cycling of materials in anaerobic

---

[1] Title V Permit No. 556483 is currently in draft form.

[2] Also referred to as a Renewable Energy facility.

environments. Landfill gas generation, including rate and composition, proceeds through four phases. [1]

- The first phase is aerobic [i.e., with oxygen (O2 ) available] and the primary gas produced is CO2.
- The second phase is characterized by O2 depletion, resulting in an anaerobic environment, where large amounts of CO2 and some hydrogen ($H_2$) are produced.
- In the third phase, $CH_4$ production begins, with an accompanying reduction in the amount of CO2 produced. Nitrogen ($N_2$) content is initially high in landfill gas in the first phase, and declines sharply as the landfill proceeds through the second and third phases.
- In the fourth phase, gas production of $CH_4$, $CO_2$, and $N_2$ becomes fairly steady. The total time and phase duration of gas generation varies with landfill conditions (i.e., waste composition, design management, and anaerobic state).

As defined in Title V Permit No. 548537, the West Camden landfill currently operates an open process flare that has a capacity of 4,000 scfm to control LFG emissions.

The new engines are proposed for installation to process LFG as a source renewable energy. As described, LFG contains $CH_4$, a greenhouse gas that can be captured and used to fuel power plants, manufacturing facilities, vehicles, homes, and more. LFGTE projects are encouraged by the EPA[2] and offset the use of non-renewable resources such as coal, natural gas, and oil, which reduces power plant emissions; and helps reduce local air pollution by reducing volatile organic compound emissions.

---

[1] Reference US EPA AP-42, Section 2.4, 11/98 ed.

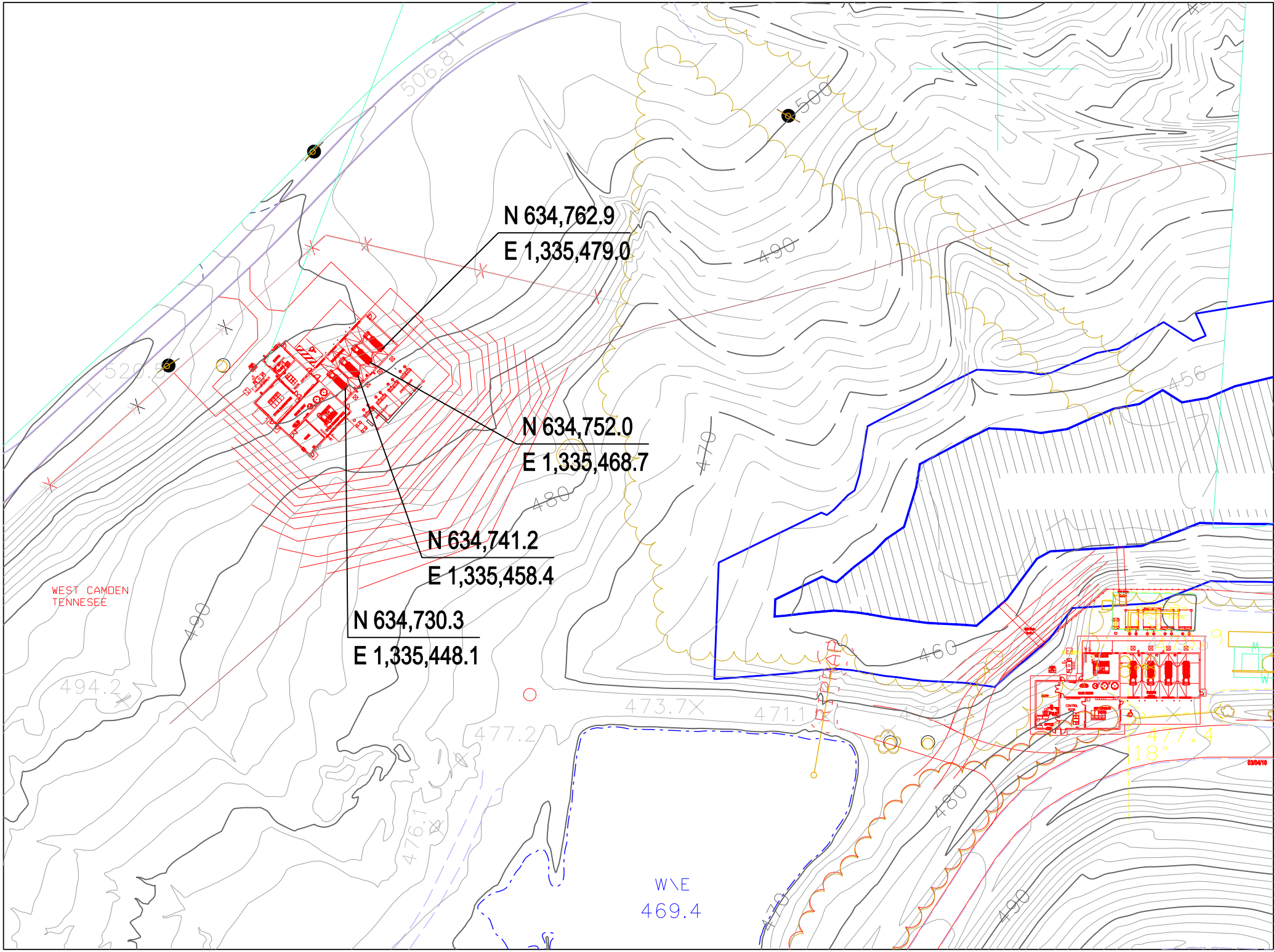
[2] The U.S. EPA's Landfill Methane Outreach Program (LMOP) is a voluntary assistance program that helps to reduce methane emissions from landfills by encouraging the recovery and use of landfill gas (LFG) as an energy resource.

## *1.3 APPLICATION CONTENTS*

Key components of this application are organized as follows:

- Area maps and plot plans, including two (2) optional views for locating the facility, are provided at the end of Section 1.
- A process description and process flow diagram is included in Section 2.
- Emission rate calculations are discussed in Section 3.
- Regulatory applicability and compliance strategies are addressed in Section 6.
- Appendix A contains completed TN Department of Environment & Conservation, Division of Air Quality construction forms, using APC 20 and Title V forms as is directed for Title V facilities.
- Appendix B contains emission rate calculations for the engines.
- Appendix C contains the technical specification sheets for the Caterpillar 3520 engine.
- Appendix D contains example Subparts JJJJ and ZZZZ permit conditions.

*Figure 1-1*
*Stack Coordinates*




...\dms21842\Tn04t10_2-25-10.dgn 4/27/2010 10:36:05 AM

*Figure 1-2*
*Location Map*

PRELIMINARY

EXISTING DIRT ROAD

510

500

490

3

2

1

SCALE

0 5 10 15 20

# PROPOSED OPTION - 2

## ENLARGED EXISTING PLAN NOTES FOR OPTION - 2

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Outline of Proposed Plant Bldg | ? | ??? | ? | ??? | ? | ??? | ? | ??? |
| 2 | EXISTING FENCE | ? | ??? | ? | ??? | ? | ??? | ? | ??? |
| 3 | EXISTING POWER POLE LINE | ? | ??? | ? | ??? | ? | ??? | ? | ??? |
| ? | ??? | ? | ??? | ? | ??? | ? | ??? | ? | ??? |
| ? | ??? | ? | ??? | ? | ??? | ? | ??? | ? | ??? |
| ? | ??? | ? | ??? | ? | ??? | ? | ??? | ? | ??? |
| ? | ??? | ? | ??? | ? | ??? | ? | ??? | ? | ??? |

| NO | DATE | DESCRIPTION |
|---|---|---|
| 1 | ??? | 50% REVIEW SET |
| 2 | ??? | 100% REVIEW SET |
| 3 | ??? | CONSTRUCTION/PERMIT SET |

WEST CAMDEN
TENNESEE

SCALE ??

PROJECT NO. A_44103

DATE 3/11/10

DRAWN BY MR

CHECKED BY SO

SHEET TITLE SITE PLAN

SHEET NO. 5 OF 6

*Figure 1-3*
*Detailed Overhead View*

# PRELIMINARY

# PROPOSED OPTION - 2

## PROPOSED NEW PLAN NOTES FOR OPTION - 2

| | | | | | |
|---|---|---|---|---|---|
| 1 | NEW ENGINE POWER PLANT | 8 | NEW UG Prime Pwr Svc + Metering?? | 15 | |
| 2 | CONC APRON | 9 | VERIFY NEW TELECOM SERVICE | 16 | |
| 3 | CONC SIDEWALK | 10 | NEW ENTRY GATE | 17 | |
| 4 | TRANSFORMERS ON CONC PADS | 11 | VERIFY SAN SWR HOLDING TANK?? | ? | |
| 5 | RECLOSER | 12 | VERIFY DOMESTIC WATER ENTRY?? | ? | |
| 6 | GRAVEL ON GEOTEC FABRIC | 13 | | ? | |
| 7 | NEW Gas Header/Condensate/Purge | 14 | | ? | |

| NO | DATE | DESCRIPTION |
|---|---|---|
| 1 | ??? | 50% REVIEW SET |
| 2 | ??? | 100% REVIEW SET |
| 3 | ??? | CONSTRUCTION/PERMIT SET |

WEST CAMDEN
TENNESEE

SCALE ??

PROJECT NO. A_44103

DATE 3/11/10

DRAWN BY MR

CHECKED BY SO

SHEET TITLE SITE PLAN

SHEET NO. 6 OF 6

## 2.0 LFGTE PROCESS DESCRIPTION

This project will entail the installation of three (3) electrical power generation units, each unit containing a Caterpillar Model G3520C reprocating internal combustion engine, an electrical generator, and auxiliary systems. The engines are low emission, lean-burn, four-stroke, turbocharged, after cooled units each rated at 2,233 bhp, and a nominal rated heat input of 14.53 MM BTU's per hour. LFG will be collected and conveyed by the GCCS to the proposed LFGTE facility as well as continuing to be conveyed to the existing open process flare.

In order to be used as engine fuel, LFG will be passed through a treatment system. The treatment system will consist of inline filters to remove particulates entrained in the gas stream. Following filtration, the gas will then be compressed and dehydrated. The treated LFG will be used as fuel in the gas engines that drive the electrical generators.

For purposes of Subpart WWW, the treatment system will be the non-methane organic compound (NMOC) control device. Because the engines follow the treatment system, the engines will not be subject to control device requirements defined in Subpart WWW. Subpart WWW requirements are summarized in Section 4.0.

As previously stated, the engines will be fueled only by LFG. No alternative fuels are proposed as part of this application.

In accordance with 40 CFR Part 60, Subpart JJJJ, new stationary spark ignition (SI) internal combustion engines (ICE) with a maximum engine power greater than 19 KW (25 HP) that are not gasoline fueled and are not rich burn engines fueled by liquefied petroleum gas (LPG), will be required to meet provisions of the Subpart. Subpart JJJJ provisions applicable to the Caterpillar G3520C engines are summarized in Section 3.

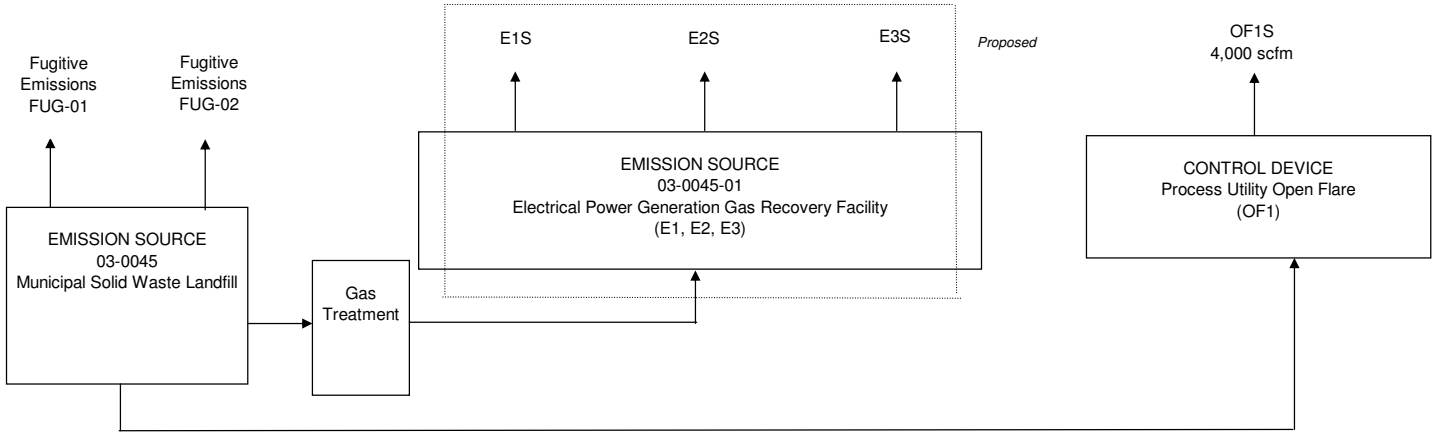
The engine technical specification sheet for the Caterpillar 3520 engines is contained in Appendix C.

A simple process flow diagram is shown in Figure 2-1

*Figure 2-1*
*Process Flow Diagram*

**Waste Management - West Camden Sanitary Landfill**
**Renewable Energy Project**

**PROCESS FLOW DIAGRAM**




FUG-01 - uncontrolled fugitive emissions from the municipal solid waste landfill facility
FUG-02 - uncontrolled fugitive emissions from landfill operations (vehicles and construction)
E1S - Reciprocating Internal Combustion Engine E1 Stack
E2S - Reciprocating Internal Combustion Engine E2 Stack
E3S - Reciprocating Internal Combustion Engine E3 Stack
OF1S - Open Process Utility Flare

**Figure No. 1 - Form APC V.2**
**Process Flow Diagram**
**West Camden Sanitary Landfill**
**Camden, Tennessee**

## 3.0 EMISSIONS CALCULATIONS METHODOLOGY - LANDFILL GAS-TO-ENERGY FACILITY

Potential emissions are calculated for the Caterpillar G3520C engines. Emissions from other processes within the LFGTE facility are considered negligible. The engines are assumed to be operating non-stop at full load throughout the year. Therefore, emissions are calculated based on 8,760 hours per year at the nominal horsepower rating of 2233 BHP, and a heat input rating of 14.53 MM BTU's per hour with the exception of VOC. Maximum hourly VOC emissions are based on the Subpart JJJJ allowable 1.0 g/hp-hr. Annual VOC emissions are based on 20 ppmv concentration of NMOC (as hexane) in the engine exhaust.

Based on process operating experience, LFG is assumed to have an hourly $CH_4$ content of 55%, and an annual average $CH_4$ content of 50%. The higher heating value (HHV) of 1012 BTU's per cubic foot of gas is assumed in the calculations for $CH_4$. The engines are low emission units that are designed to meet the emission requirements of Subpart JJJJ, and by doing so, will also meet low NOx emissions requirements of Tennessee.

Waste Management proposes the following criteria pollutant emissions factors and potential emissions for the engines:

### Table 3-1: Criteria Pollutant Emissions for CAT G3520 C Engines

**(1)(2)(3)(4) Criteria Pollutant Emissions For CAT G3520C Engines**

| *(calculations are for Nominal fuel consumption per engine)* | | | Per Engine Basis | | Total of Three Engines | |
|---|---|---|---|---|---|---|
| Pollutant | E.F. | Units | Emission Rate (lb/hr) | Emission Rate (ton/yr) | -3 Engines - Emission Rate (lb/hr) | - 3 Engines - Emission Rate (ton/yr) |
| NOx | 0.6 | g/bhp-hr | 2.95 | 12.93 | 8.85 | 38.78 |
| CO | 3.5 | g/bhp-hr | 17.21 | 75.40 | 51.64 | 226.20 |
| $PM/PM_{10}/PM_{2.5}$ | 48.0 | lb/MMcf Methane | 0.69 | 3.02 | 2.07 | 9.06 |
| $SO_2$ | 500 | ppmv | 2.20 | 10.62 | 6.61 | 31.86 |
| VOC | 1.0<br>20.0 | g/bhp-hr (outlet) /<br>ppmv (annual) | 4.92 | 4.12 | 14.76 | 12.35 |

**notes:**

1) 379.50 cf/lb-mole @ standard conditions
2) maximum VOC hourly emissions based on Subpart JJJJ allowable (1.0 g/BHP-Hr). Annual VOC is based on 20 ppmv (7% $O_2$) concentration in exhaust.
3) 55% CH4 on lb/hr, 50% CH4 annual basis. Based on engine heat requirement more LFG is required to fuel the engine at the 50% annual CH4 concentration.
4) PM for engine emissions is considered primarily $PM_{2.5}$ per AP-42.

It should be noted that the engines represent the only change in emissions at the facility. No changes will be made to the GCCS or flare.

NOx and CO emission factors are proposed by Waste Management based on Caterpillar specifications for the G3520C engines, but mainly based on experience operating the engines at other landfills. We are proposing a NOx emission factor of 0.6 g/hp-hr, and a CO emission factor of 3.5 g/hp-hr. It should be noted that the proposed CO emission factor is less than the 4.13 g/hp-hr emission factor defined in the Caterpillar G3520C specification sheet. The horsepower used in the calculations was the nominal horsepower rating of 2233 BHP. Hourly emissions are calculated as:

**NOx:**

$$P_e \times EF_{NOx} \div 454$$

Where:

$P_e$ = Engine Rating, hp

$EF_{NOx}$ = Emission Factor for NOx, gr NOx/bhp - hr

454 = conversion factor, gr/lb

$$\frac{2233\,bhp-hr \times 0.6\,\frac{gr}{bhp-hr}}{454\,\frac{gr}{lb}} = 2.95\,\frac{lb}{hr}$$

**CO:**

$$P_e \times EF_{NOx} \div 454$$

Where:

$P_e$ = Engine Rating, hp

$EF_{CO}$ = Emission Factor for CO, gr NOx/bhp - hr

454 = conversion factor, gr/lb

$$\frac{2233\,bhp-hr \times 3.5\,\frac{gr}{bhp-hr}}{454\,\frac{gr}{lb}} = 17.21\,\frac{lb}{hr}$$

The $PM/PM_{10}/PM_{2.5}$ emission factor is provided by AP-42, Table 2.4-5 for IC engines and is based on $CH_4$ being used as fuel in the engines. The emission rate assumes that $CH_4$ has a heat value of 1012 BTUs/cf. Because the methane heat value is considered constant at 1012 BTUs/cf and the engine maximum heat input rating is 14.53 MM BTU/hr, any change to the total amount of LFG burned in the engine (annual vs. hourly) will not

affect the emission calculation. Therefore 8,760 hrs/yr x lb/hr ÷ 2000 ton/yr will yield the calculated annual tonnage. PM is calculated as:

**PM:**

$$\frac{H_e}{H_{CH4}} \times EF_{PM}$$

Where:

$H_e$ = Engine Heat Input Rating, MM BTUs/hr

$H_{CH4}$ = Heat Value of $CH_4$, BTUs/cf

$EF_{PM}$ = PM emission factor, lb/MMcf $CH_4$

$$\frac{14.53\,\frac{MMBTU}{hr}}{1012\,\frac{BTU}{cfCH_4}} \times 48\,\frac{lb}{MMcfCH_4} = 0.69\,\frac{lb}{hr}$$

$SO_2$ emissions occur from combustion of fuel; in this case LFG. LFG contains $H_2S$. $H_2S$ occurs mainly from decomposition of materials that contain gypsum, such as wall boards used in the construction industry. The amount of $H_2S$ generated varies as conditions within the landfill change; however Waste Management assumes a maximum 500 ppmv in the West Camden LFG. The assumption is based on operating experience.

$H_2S$ is combusted in the engines. The product of $H_2S$ combustion is $SO_2$ and water. The reaction may occur as:

$$3O_2 + 2H_2S \longrightarrow 2SO_2 + 2H_2O$$

$SO_2$ emissions are calculated as:

**$SO_2$:**

$$\mathrm{Conc}_{SO_2} \times \frac{\mathrm{MW}_{SO_2}}{\mathrm{MW}_{gas}} \times Q_{LF}$$

Where:

$\mathrm{Conc}_{SO_2}$ = *concentration* $SO_2$, ppmv

$Q_{LF}$ = Landfill Gas Flowrate to one engine, scf/hr

$\mathrm{MW}_{SO_2}$ = $SO_2$ Molecular Weight

$MW_{gas}$ = volume of gas at standard conditions

$$\frac{500\ ppmv}{10^6} \times \frac{64.06\ \frac{lb}{lb-mol}}{379.5\ \frac{cf}{lb-mol}} \times 26{,}113\ \frac{cf}{hr} = 2.20\ \frac{lb}{hr}$$

Maximum hourly VOC emissions are estimated assuming the Subpart JJJJ allowable emission rate of 1.0 grams VOC/bhp-hr. Hourly VOC emissions are calculated as:

**VOC** (maximum hourly)**:**

$P_e \times EF_{NOx} \div 454$

Where:

$P_e$ = Engine Rating, hp

$EF_{VOC}$ = Emission Factor for VOC, gr VOC/bhp - hr

454 = conversion factor, gr/lb

$$\frac{2233\ bhp-hr \times 1.0\ \frac{gr}{bhp-hr}}{454\ \frac{gr}{lb}} = 4.92\ \frac{lb}{hr}$$

Annual VOC emissions are calculated based on an engine exhaust concentration of 20 ppmv at 7% $O_2$. Annual VOC is calculated as:

**VOC** (annual)**:**

$$\frac{Conc_{VOC}}{1{,}000{,}000} \times \frac{MW_{VOC}}{MW_{gas}} \times Q_{exhaust\ 7\%\ O_2} \times \min/hr \times \frac{hr/yr}{lb/ton}$$

Where:

$Conc_{VOC}$ = 20 ppmv in the engine exhaust at 7% $O_2$

$Q_{exhaust\ 7\%}O_2$ = 3,450 dscfm

$MW_{VOC}$ = V*OC* Molecular Weight (as hexane)

$MW_{gas}$ = volume of gas at standard conditions

$$\frac{20\ ppmv}{10^6} \times \frac{86.18\ \frac{lb}{lb-mol}}{379.5\ \frac{cf}{lb-mol}} \times 3{,}450\ \frac{cf}{\min} \times 60\ \frac{\min}{hr} \times \frac{8{,}760\ \frac{hr}{yr}}{2{,}000\ \frac{lb}{ton}} = 4.12\ \frac{ton}{yr}$$

The concentrations of HAPs in the LFG were conservatively obtained from the document "Waste Industry Air Coalition Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values" dated Jan 2001. Waste Management Renewable Energy LLC (WMRE) believes that the Waste Industry Air Coalition (WIAC) values for default concentrations of hazardous air pollutants (HAPs) in landfill gas (LFG) to be the most representative values for use at the West Camden Landfill.

The percent conversion of chlorinated compounds in LFG to HCl, and HAP control efficiencies of the engines are based on the US Environmental Protection Agency's (EPA's) Compilation of Air Pollutant Emission Factors (AP-42) for MSW landfills Table 2.4-3.

HAP emissions calculations are summarized in Appendix B, *Emission Rate Calculations*. With the exception of mercury and HCl[1], in which no destruction efficiencies are assumed in the engines, destruction efficiencies for organic compounds are applied as defined in Appendix B.

[1] Per AP-42, Section 2.4, it is assumed that all of the chloride ion from the combustion of chlorinated LFG constituents is converted to HCl.

An example calculation for vinyl chloride is:

**Vinyl Chloride:**

$$\frac{Q_{LF} \times conc_{VC} \times MW_{VC}}{10^6 \times 379.5} \times (1 - d.e.)$$

Where:

$Q_{LF}$ = Flowrate of LFG, scf/hr

$conc_{VC}$ = vinyl chloride concentration, ppmv

$MW_{VC}$ = molecular weight of vinyl chloride, lb/lb-mole

d.e. = the destruction efficiency assumed in the engine

$$\frac{26{,}113 \frac{cf}{hr} \times 7.34\ ppmv \times 62.5 \frac{lb}{lb-mol}}{10^6 \times 379.5 \frac{cf}{lb-mol}} \times (1 - 0.93) = 0.0022 \frac{lb}{hr}$$

# 4.0 REGULATORY REVIEW

## 4.1 FEDERAL REQUIREMENTS

### 4.1.1 40 CFR Part 60, New Source Performance Standards (NSPS)

### 4.1.2 Subpart WWW, Standards of Performance for Municiple Solid Waste Landfills

As previously discussed, in 1992, the facility had a design capacity to handle above 2.5 million Mg of trash and had a trash storage volume in excess of 2.5 million cubic meters. Therefore, the West Camden facility is subject to Federal NSPS requirements of 40 CFR Part 60, Subpart WWW for Municipal Solid Waste Landfills. The landfill has been operating a gas collection and control system (GCCS) in accordance with Subpart WWW since 1997.

No changes are being proposed at this time for the GCCS. No changes are being proposed for the open process flare. The LFG treatment system will reside before the engines and will be operated in accordance with Subpart WWW, 40 CFR §60.752. Therefore, for Subpart WWW, the engines will not be defined as the control device and will not be subject to the requirements of Subpart WWW.

### 4.1.3 Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Per §60.4230(a)(4)(i), Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, will be applicable to the three new spark ignition (landfill gas-fired) lean burn engines planned for the West Camden location. These units will be rated at 2,233 BHP each at full load. By all definitions therein, these engines will be subject to Subpart JJJJ as "new" emission sources.

As such, applicable emissions standards for these engines are found in Table 1 of Subpart JJJJ as follows:

**Table 4-1: Subpart JJJJ - Emission Standards**

| Engine Type and Fuel | Maximum Engine Power | Manufacture Date | Emission Standards | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | g/HP-hr | | | ppmvd @ 15% O2 | | |
| | | | NOx | CO | VOC | NOx | CO | VOC |
| Landfill/Digester Gas (except lean burn 500≥HP<1350) | HP ≥500 | 7/1/2007 | 3.0 | 5.0 | 1.0 | 220 | 610 | 80 |
| | | 7/1/2010 | 2.0 | 5.0 | 1.0 | 150 | 610 | 80 |

The engines will not be certified by the manufacturer as defined in 40 CFR §60.4231. Therefore, Subpart JJJJ non-certified engine requirements will apply to the engines including maintenance plans, notifications, recordkeeping, monitoring, and testing. Non-certified engine requirements are summarized in the attached TDEC application forms. Appendix D contains example permit conditions for Subparts JJJJ and ZZZZ.

## 4.2 *NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)*

### 4.2.1 *Subpart ZZZZ: National Emission Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines*

40 CFR 63 Subpart ZZZZ, the MACT standard for reciprocating internal combustion engines (RICE), establishes emission limits and operating limits for HAP emissions from stationary RICE (including spark ignition and compression engines) located at sources of HAP emissions [40 CFR 63.6580]. This standard applies to existing, new, or reconstructed stationary spark-ignition or compression-ignition RICE [40 CFR 63.6590(a)].

Waste Management will install engines at West Camden that are defined as stationary reciprocating internal combustion engines (RICE). An affected source is a new source if it was constructed after June 12, 2006 [40 CFR 63.6590(a)(2)(iii)], so the engines will be classified as new stationary RICE under this MACT standard.

As the Waste Management facility at West Camden is an area source for HAPs, these new engines shall comply in full with Subpart ZZZZ by demonstrating compliance with the aforementioned Subpart JJJJ [40 CFR 63.6590(c)]. No additional requirements of Subpart ZZZZ will apply.

## 4.3 *40 CFR §52.21 PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY (PSD)*

The West Camden facility is located in Benton County, TN. Benton County is currently in attainment for regulated pollutants. The West Camden landfill currently does not have the potential to emit 250 tons per year or more of any regulated NSR pollutant and is not a listed source with a potential to emit 100 tons per year or more. Therefore, the facility is not a PSD facility.

As previously discussed and presented in Table 3-1, the construction of the LFGTE facility will not have potential emissions greater than major source applicability levels. Following construction, the facility will have the potential to emit 414.83 tons per year of CO. Any future source

modifications or construction will be compared to the requirements of 40 CFR Part 52, §52.21.

## 4.4 *STATE OF TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REQUIREMENTS*

State of Tennessee Department of Environment and Conservation (TDEC) Requirements are summarized in the following table:

**Table 4-2: TDEC Requirements Applicable To The Reciprocating Engines**

| Standard | Regulation Basis | Requirement |
|---|---|---|
| General Provisions | 1200-03-01 thru 05 | Required for all sources |
| **Process Emission Standards** | | |
| Particulate Matter | 1200-03-07-.04(1) | (1) Irrespective of the maximum allowable emission as determined by any of the preceding equations or Process Weight Tables in this chapter, the concentration of particulate process emissions shall not be required to be less than 0.02 grain per dry cubic foot of stack gases corrected to 70°F and 1 atmosphere unless a lesser concentration is found by the Board to be necessary. |
| Sulfur Dioxide | 1200-03-14-.03 | [1]Air contaminant sources in Benton County (Class VI) shall emit $SO_2$ in excess of 2,000 parts per million, 0.20 percent volume, dry basis over a one-hour average. Also, as a new source of $SO_2$, these engines shall make use of best available control technology as deemed appropriate by the Technical Secretary of the Tennessee Air Pollution Control Board. |
| Nitrogen Oxides | 1200 03-27-.03 | Since it located in Benton County, this site is not required to apply reasonably available control technology (RACT), pursuant to TDEC 1200 03-27-.03. Also, as these are new Stationary Internal Combustion (IC) Engines and not a part of EPA's NOx SIP Call Engine Inventory, they are not subject to the compliance plan requirements of TDEC 1200-03-27-.09. |
| Volatile Organic Compounds | 1200-03-07-.07 | If an air contaminant source emitting gaseous air contaminants is constructed or relocated less than 1 kilometer, the Technical Secretary may require installation and utilization of equipment deemed "reasonable and proper." |
| **Additional Requirements** | | |
| Monitoring Of Source Emissions, Recording, And Reporting | 1200-03-10-.02 | Monitoring, recording and recordkeeping requirements are summarized in Federal NSPS and MACT requirements. Compliance with the Federal requirements will demonstrate compliance with TDEC regulations. |
| New Source Performance Standards | 1200-03-16 | Summarized in Federal Requirements |

[1] Waste Management is proposing $SO_2$ emissions based on 500 ppmv.

| Standard | Regulation Basis | Requirement |
|---|---|---|
| Limits On Emissions Due To Malfunctions, Startups, And Shutdowns | 1200-03-20 | Required per 40 CFR Part 63 |

*Appendix A*
*TDAQ Forms*

- *Construction*
- *Title V*

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL

NOT TO BE USED FOR TITLE V APPLICATIONS

9th Floor, L & C Annex
401 Church Street
Nashville, TN 37243-1531
Telephone:( 615 ) 532-0554
FAX: ( 615 ) 532-0614

# PERMIT APPLICATION

APC 20

PLEASE TYPE OR PRINT AND SUBMIT IN DUPLICATE FOR EACH EMISSION SOURCE. ATTACH APPROPRIATE SOURCE DESCRIPTION FORMS.

| | | | |
|---|---|---|---|
| **1. ORGANIZATION'S LEGAL NAME**<br>West Camden Sanitary Landfill | | / / /<br>FOR | APC COMPANY--POINT NO. |
| **2. MAILING ADDRESS** (ST/RD/P.O. BOX)<br>2410 Highway 70 West | | / / /<br>APC | APC LOG/PERMIT NO. |
| CITY<br>Camden | STATE<br>Tennessee | ZIP CODE<br>38320 | PHONE WITH AREA CODE<br>(901) 584-7734 |
| **3. PRINCIPAL TECHNICAL CONTACT**<br>David Thorley | | | PHONE WITH AREA CODE<br>(713) 328-7404 |
| **4. SITE ADDRESS** (ST/RD/HWY)<br>2410 Highway 70 West | | | COUNTY NAME<br>Benton |
| CITY OR DISTANCE TO NEAREST TOWN<br>Camden, Tennessee | | ZIP CODE<br>38320 | PHONE WITH AREA CODE<br>(901) 584-7734 |
| **5. EMISSION SOURCE NO.** (NUMBER WHICH UNIQUELY IDENTIFIES THIS SOURCE)[1]<br>03-0045-01 | | PERMIT RENEWAL<br>YES ( ) NO ( X ) | |

**6. BRIEF DESCRIPTION OF EMISSION SOURCE**

Three (3) Reciprocating Engines (landfill gas-fired).

This APC 20 is for the construction of three (3) Reciprocating Engines, No's. 1, 2, & 3 (E1, E2, & E3). The Reciprocating Engines are Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engines. The engines are rated at 2233 BHP at 100% load, and have a nominal fuel consumption rating of 6509 Btu/bhp-hr (14.53 MM Btu/hr). The reciprocating internal combustion engines will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with the existing open process flare unit to control landfill gas emissions.

**7. TYPE OF PERMIT REQUESTED**

| | | | | |
|---|---|---|---|---|
| CONSTRUCTION<br>( X ) | STARTING DATE<br>June 1, 2010 | COMPLETION DATE<br>18 months after commencement of construction | LAST PERMIT NUMBER<br>556483 (draft) | EMISSION SOURCE REFERENCE NUMBER<br>03-0045 |
| OPERATING<br>( ) | DATE CONSTRU-CTION | DATE COMPLETED | LAST PERMIT NUMBER | EMISSION SOURCE REFERENCE NUMBER |
| LOCATION TRANSFER<br>( ) | TRANSFER DATE | | LAST PERMIT NUMBER | EMISSION SOURCE REFERENCE NUMBER |

ADDRESS OF LAST LOCATION

**8. DESCRIBE CHANGES THAT HAVE BEEN MADE TO THIS EQUIPMENT OR OPERATION SINCE THE LAST CONSTRUCTION OR OPERATING PERMIT APPLICATION.**

N/A

| | | |
|---|---|---|
| **9. SIGNATURE** (APPLICATION MUST BE SIGNED BEFORE IT WILL BE PROCESSED) | | **DATE** |
| **10. SIGNER'S NAME** (TYPE OR PRINT) | **TITLE** | **PHONE WITH AREA CODE** |

(OVER)



[1] Proposed source number 01.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
# INDEX OF AIR POLLUTION PERMIT APPLICATION FORMS

| 1. ADMINISTRATION | |
|---|---|
| This application contains the following forms: | APC Form V.1, Facility Identification<br>West Camden Sanitary Landfill |
| | APC Form V.2, Operations and Flow Diagrams |

| 2. EMISSIONS SOURCE DESCRIPTION | | TOTAL NUMBER OF THIS FORM |
|---|---|---|
| This application contains the following forms (one form for each incinerator, printing operation, fuel burning installation, etc.): | APC Form V.3, Stack Identification | 3 |
| | APC Form V.4, Fuel Burning Non-Process Equipment | |
| | APC Form V.5, Stationary Gas Turbines or Internal Combustion Engines | 3 |
| | APC Form V.6, Storage Tanks | |
| | APC Form V.7, Incinerators | |
| | APC Form V.8, Printing Operations | |
| | APC Form V.9, Painting and Coating Operations | |
| | APC Form V.10, Miscellaneous Processes | |
| | APC Form V.33, Stage I and Stage II Vapor Recovery Equipment | |
| | APC Form V.34, Open Burning | |

| 3. AIR POLLUTION CONTROL SYSTEM | | TOTAL NUMBER OF THIS FORM |
|---|---|---|
| This application contains the following forms (one form for each control system in use at the facility): | APC Form V.11, Control Equipment - Miscellaneous | |
| | APC Form V.12, Condensers | |
| | APC Form V.13, Adsorbers | |
| | APC Form V.14, Catalytic or Thermal Oxidation Equipment | |
| | APC Form V.15, Cyclones/Settling Chambers | |
| | APC Form V.16, Electrostatic Precipitators | |
| | APC Form V.17, Wet Collection Systems | |
| | APC Form V.18, Baghouse/Fabric Filters | |

MAJOR SOURCE OPERATING PERMIT APPLICATION - INDEX OF AIR POLLUTION PERMIT APPLICATION FORMS

| 4. COMPLIANCE DEMONSTRATION | | TOTAL NUMBER OF THIS FORM |
|---|---|---|
| This application contains the following forms (one form for each incinerator, printing operation, fuel burning installation, etc. ): | APC Form V.19, Compliance Certification - Monitoring and Reporting - Description of Methods for Determining Compliance | 1 |
| | APC Form V.20, Continuous Emissions Monitoring | |
| | APC Form V.21, Portable Monitors | |
| | APC Form V.22, Control System Parameters or Operating Parameters of a Process | |
| | APC Form V.23, Monitoring Maintenance Procedures | 1 |
| | APC Form V.24, Stack Testing | 1 |
| | APC Form V.25, Fuel Sampling and Analysis | |
| | APC Form V.26, Record Keeping | 1 |
| | APC Form V.27, Other Methods | 1 |
| | APC Form V.28, Emissions from Process Emissions Sources / Fuel Burning Installations / Incinerators | 1 |
| | APC Form V.29, Emissions Summary for the Facility or for the Source Contained in This Application | 1 |
| | APC Form V.30, Current Emissions Requirements and Status | 1 |
| | APC Form V.31, Compliance Plan and Compliance Certification | 1 |
| | APC Form V.32, Air Monitoring Network | |

5. STATEMENT OF COMPLETENESS AND CERTIFICATION OF COMPLIANCE

I have reviewed this application in its entirety and to the best of my knowledge, and based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete. I have provided all the information that is necessary for compliance purposes and this application consists of _____20___ pages and they are numbered from page __1___ to __20___. The status of this facility's compliance with all applicable air pollution control requirements, including the enhanced monitoring and compliance certification requirements of the Federal Clean Air Act, is reported in this application along with the methods to be used for compliance demonstration.

Name and Title of Responsible Official | Telephone Number with Area Code

Signature of Responsible Official | Date of Application

(FOR DEFINITION OF RESPONSIBLE OFFICIAL, SEE INSTRUCTIONS FOR APC FORM V.1)

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L &C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## FACILITY IDENTIFICATION

| | | |
|---|---|---|
| 1. FACILITY NAME AND OWNER'S NAME IF DIFFERENT FROM THE FACILITY NAME:<br>West Camden Sanitary Landfill / H&W Environmental Services, Inc. | FOR | APC COMPANY NO. |
| MAILING ADDRESS ( ST/RD/P.O. BOX ):<br>2410 Highway 70 West | APC | LOG/PERMIT NO. |
| CITY, STATE, ZIP CODE:<br>Camden, Tennessee 38320 | USE ONLY | |

| | |
|---|---|
| 2. FACILITY LOCATION ( ST/RD/HWY ):<br>2410 Highway 70 West | COUNTY NAME:<br>Benton |
| CITY OR DISTANCE TO NEAREST TOWN, ZIP CODE:<br>Camden, Tennessee | TELEPHONE NUMBER WITH AREA CODE:<br>(901) 584-7734 |

3. FACILITY'S PRIMARY ACTIVITY AND THE FIRST TWO DIGITS OF THE FACILITY SIC CODE( S ):
Municipal Solid Waste Landfill (49)

| | | |
|---|---|---|
| 4. CONTACT PERSON'S NAME FOR THIS PERMIT:<br>David Thorley | TITLE:<br>WM Director of Air Programs-South | TELEPHONE NUMBER WITH AREA CODE<br>(713) 328-7404 |

5. IF FACILITY IS LOCATED IN AN AREA DESIGNATED AS "NONATTAINMENT" OR "ADDITIONAL CONTROL", INDICATE THE POLLUTANT ( S ) FOR THE DESIGNATION.
N/A

6. LIST ALL VALID AIR POLLUTION PERMITS ISSUED TO THE SOURCES CONTAINED IN THIS APPLICATION [ IDENTIFY ALL PERMITS WITH MOST RECENT PERMIT NUMBERS AND EMISSION SOURCE REFERENCE NUMBERS LISTED ON THE PERMIT(S) ].
[1]Title V Operating Permit No. 556483 (draft):
Emission Source Reference No. 03-0045: Municipal Solid Waste Landfill.

-Construction permit for three (3) Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engines. The engines are fired by landfill gas.

7. PERMIT REQUESTED FOR:

INITIAL APPLICATION TO OPERATE : _____X_____ RELOCATION TO OPERATE : _____

MODIFICATION : _____ PERMIT RENEWAL TO OPERATE : _____

REVISION ( ADMINISTRATIVE AMENDMENTS ) : _____

| | |
|---|---|
| 8. OWNER'S REGISTERED AGENT'S NAME & ADDRESS FOR SERVICE OF PROCESS<br>C. T. Corporation<br>530 Gay Street<br>Knoxville, TN 37902 | TELEPHONE NUMBER WITH AREA CODE<br>(423) 546-8030 |

9. IS THIS FACILITY SUBJECT TO THE PROVISIONS GOVERNING PREVENTION OF ACCIDENTAL RELEASES OF HAZARDOUS AIR CONTAMINANTS CONTAINED IN CHAPTER 1200-3-32 OF THE TENNESSEE AIR POLLUTION CONTROL REGULATIONS?

_____ YES ____X_____ NO

IF THE ANSWER IS YES, ARE YOU IN COMPLIANCE WITH THE PROVISIONS OF CHAPTER 1200-3-32 OF THE TENNESSEE AIR POLLUTION CONTROL REGULATIONS?

YES NO

| | | |
|---|---|---|
| 10. PAGE NUMBER :<br>1 | REVISION NUMBER: | DATE OF REVISION: |



[1] Title V Permit No. 556483 is in draft form at the time of this application.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## OPERATIONS AND FLOW DIAGRAMS

1. PLEASE LIST, IDENTIFY AND DESCRIBE BRIEFLY PROCESS EMISSION SOURCES, FUEL BURNING INSTALLATIONS, AND INCINERATORS THAT ARE CONTAINED IN THIS APPLICATION. PLEASE ATTACH A FLOW DECAGRAM FOR THIS APPLICATION.

Application is for the construction of three (3) Caterpillar (CAT) G3520C low emissions; spark ignited, turbo charged, after-cooled engines. The engines will be fired by landfill gas.

The proposed description of this process is:

**Three (3) Reciprocating Internal Combustion Engines:** Landfill gas fired. Engines (PES E1, E2, and E3) are Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled units. Each engine is rated at a nominal fuel capacity of 14.53 MM Btu/hr (combined capacity of 43.6 MM BTUs per hour). Engines (PES E1, E2, and E3) have individual emission stacks (emission points E1S, E2S, and E3S). The reciprocating internal combustion engines will be fired with landfill gas (LFG).

*[1]Diagram: Emission release point identifications E1S-E3S refer to the emissions from the reciprocating internal combustion engines. Emission release point OF1S refers to the existing 4,000 scfm open process flare.

2. LIST ALL INSIGNIFICANT ACTIVITIES WHICH ARE EXEMPTED BECAUSE OF SIZE OR PRODUCTION RATE AND CITE THE APPLICABLE REGULATIONS.

N/A

3. ARE THERE ANY STORAGE PILES?

YES _____ NO ____X_____

4. LIST THE STATES THAT ARE WITHIN 50 MILES OF YOUR FACILITY

Kentucky

5. PAGE NUMBER: 2 REVISION NUMBER: DATE OF REVISION



[1] See Attachment: Figure No. 1.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## EMISSION SUMMARY FOR THE FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION

1. FACILITY NAME:
West Camden Sanitary Landfill

2. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS AT THIS FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION.[1]

| AIR POLLUTANT | SUMMARY OF MAXIMUM ALLOWABLE EMISSIONS | | SUMMARY OF ACTUAL EMISSIONS[1] | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 4, APC V.28 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 4, APC V.28 ) |
| PARTICULATES ( TSP ) | N/A | | 17.99 | |
| SULFUR DIOXIDE | N/A | | 120.57 | |
| VOLATILE ORGANIC COMPOUNDS | N/A | | 12.83 | |
| CARBON MONOXIDE | N/A | | 414.83 | |
| LEAD | N/A | | N/A[2] | |
| NITROGEN OXIDES | N/A | | 73.44 | |
| TOTAL REDUCED SULFUR | N/A | | Included in $SO_2$ | |
| MERCURY | N/A | | 0.00022 | |
| ASBESTOS | N/A | | N/A[2] | |
| BERYLLIUM | N/A | | N/A[2] | |
| VINYL CHLORIDES | N/A | | 0.00842 | |
| FLUORIDES | N/A | | N/A[2] | |
| GASEOUS FLUORIDES | N/A | | N/A[2] | |
| Total 112(b) Hazardous Air Pollutants (including HCl). | N/A | | 6.145 | |

( CONTINUED ON NEXT PAGE )



[1] Source emissions included in this APC Form V.29 are reciprocating engine No's. E1, E2, and E3 and landfill gas combusted by existing open flare OF1. Landfill gas emissions controlled by the open flare No. OF1 will not change because the capacity of the landfill gas generation rate will not change.

[2] Emissions of this pollutant are assumed negligible from municipal solid waste landfills.

( CONTINUED FROM PREVIOUS PAGE )

3. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT ( S ) AT THIS FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION.

| AIR POLLUTANT & CAS | SUMMARY OF MAXIMUM ALLOWABLE EMISSIONS | | SUMMARY OF ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 5, APC V.28 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 5, APC V.28 ) |
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4. PAGE NUMBER: 3 & 4 REVISION NUMBER: DATE OF REVISION:

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## CURRENT EMISSIONS REQUIREMENTS AND STATUS

| 1. FACILITY NAME: | 2. EMISSION SOURCE NUMBER |
|---|---|
| West Camden Sanitary Landfill | 03-0045-01 |

3. DESCRIBE THE PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR.

Three (3) Reciprocating Engines (landfill gas-fired).

| 4. IDENTIFY IF ONLY A PART OF THE SOURCE IS SUBJECT TO THIS REQUIREMENT | 5. POLLUTANT | 6. APPLICABLE REQUIREMENT ( S ) : TN AIR POLLUTION CONTROL REGULATIONS, 40 CFR, PERMIT RESTRICTIONS, AIR QUALITY BASED STANDARDS | 7. LIMITATION | 8. MAXIMUM ACTUAL EMISSIONS | 9. COMPLIANCE STATUS ( IN/OUT ) |
|---|---|---|---|---|---|
| All sources with applicable requirements | N/A | TAPC 1200-3-3-.01-.05 Ambient Air Quality Standards | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-4-.01-.05 Open Burning | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-8-.01-.03 Fugitive Dust | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-9-.01-.05 Construction & Operating Permits | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-12-.01-.04 Methods of Sampling & Analysis | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-15-.01-.03 Emergency Episode Plan | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-20-.01-.08 Malfunction, startup, shutdown limits | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-23-.01-.03 Visibility Protection | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-24-.01-.04 Good engineering practices – stack height | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-26-.01-.02 Administrative Fee Schedule | * | N/A | IN |
| All sources with applicable requirements | N/A | TAPC 1200-3-31-.01-.07 Hazardous Air Pollutants | * | N/A | IN |

| 1. FACILITY NAME: West Camden Sanitary Landfill | | | 2. EMISSION SOURCE NUMBER 03-0045-01 | | |
|---|---|---|---|---|---|
| All sources with applicable requirements | N/A | TAPC 1200-3-32-.01-.03 Prevention of accidental releases | * | N/A | IN |
| Reciprocating Engines | [1]Opacity | 1200-03-05-.01 | 20% | N/A | IN |
| Reciprocating Engines | PM | 1200-03-07-.04 | 0.02 gr/dscf | N/A | IN |
| Reciprocating Engines | $SO_2$ | 1200-03-14-.03 | 2,000 ppmv[2] | N/A | IN |
| Reciprocating Engines | NOx | 40 CFR Part 60, Subpart JJJJ | 2.0 g/bhp-hr or[3] 3.0 g/bhp-hr | N/A | IN |
| Reciprocating Engines | CO | 40 CFR Part 60, Subpart JJJJ | 5.0 g/bhp-hr or | N/A | IN |
| Reciprocating Engines | VOC | 40 CFR Part 60, Subpart JJJJ | 1.0 g/bhp-hr | N/A | IN |
| 10. OTHER APPLICABLE REQUIREMENTS ( NEW REQUIREMENTS THAT APPLY TO THIS SOURCE DURING THE TERM OF THIS PERMIT ) | | | | | |
| | | | | | |
| | | | | | |
| 9. PAGE NUMBER: 5 & 6 | | REVISION NUMBER: | | DATE OF REVISION: | |

CN-1007 RDA 1298

[1] Twenty (20) percent for an aggregate of more than five (5) minutes in any one (1) hour or more than twenty (20) minutes in any twenty-four (24) hour period
[2] Benton County, Tennessee
[3] Dependent on the manufacturing date.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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9TH FLOOR, L & C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243 - 1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STACK IDENTIFICATION

| | | |
|---|---|---|
| 1. FACILITY NAME: West Camden Sanitary Landfill | FOR APC USE ONLY | APC COMPANY NO. |
| 2. STACK ID ( OR FLOW DIAGRAM POINT IDENTIFICATION ): Reciprocating Internal Combustion Engine (E1S) | | LOG/PERMIT NO. |

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. STACK HEIGHT ABOVE GRADE IN FEET:
21.0

| | |
|---|---|
| 5. VELOCITY ( DATA AT EXIT CONDITIONS ): _____192.5_____ ( ACTUAL FEET PER SECOND ) | 6. INSIDE DIMENSIONS AT OUTLET IN FEET: 1.17 |
| 7. EXHAUST FLOW RATE AT EXIT CONDITIONS ( ACFM ): 12,476 | 8. FLOW RATE AT STANDARD CONDITIONS (DSCFM): 4,869 |
| 9. EXHAUST TEMPERATURE: _____898_____ DEGREES FAHRENHEIT ( °F ) | 10. MOISTURE CONTENT (DATA AT EXIT CONDITIONS): _____N/A_____ PERCENT _____ GRAINS PER DRY STANDARD CUBIC FOOT (gr/dscf) |

11. EXHAUST TEMPERATURE THAT IS EQUALED OR EXCEEDED DURING NINETY ( 90 ) PERCENT OR MORE OF THE OPERATING TIME ( FOR STACKS SUBJECT TO DIFFUSION EQUATION ONLY ):
N/A
_____ ( °F )

12. IF THIS STACK IS EQUIPPED WITH CONTINUOUS POLLUTANT MONITORING EQUIPMENT REQUIRED FOR COMPLIANCE, WHAT POLLUTANT(S) DOES THIS EQUIPMENT MONITOR ( e.g., OPACITY, $SO_2$ , $NO_X$ , etc. )?
N/A

COMPLETE THE APPROPRIATE APC FORM(S) V.4, V.5, V.7, V.8, V.9, OR V.10 FOR EACH SOURCE EXHAUSTING THROUGH THIS STACK.

13. DO YOU HAVE A BYPASS STACK?
_____ YES ____X____ NO

IF YES, DESCRIBE THE CONDITIONS WHICH REQUIRE ITS USE & COMPLETE APC FORM V.3 FOR THE BYPASS STACK. PLEASE IDENTIFY THE STACK NUMBER( S ) OR FLOW DIAGRAM POINT NUMBER( S ) EXHAUSTING THROUGH THIS BYPASS STACK.

| 14. PAGE NUMBER: | REVISION NUMBER: | DATE OF REVISION |
|---|---|---|
| 11 | | |

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L & C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STATIONARY GAS TURBINE OR INTERNAL COMBUSTION ENGINE

1. FACILITY NAME:
West Camden Sanitary Landfill

2. LIST ALL GAS TURBINES AND INTERNAL COMBUSTION ENGINES AT THIS FACILITY ON A SEPARATE SHEET, AND PLEASE COMPLETE AN APC V.5 FORM FOR EACH PIECE OF EQUIPMENT.
Reciprocating Internal Combustion Engine (E1)

3. MANUFACTURER AND MODEL NUMBER:
Caterpillar (CAT) G3520C low emissions

4. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION( S ):
E1S

5. EQUIPMENT DESCRIPTION:
Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engine. The engine is rated at 2233 BHP at 100% load, and has a nominal fuel consumption rating of 6509 Btu/bhp-hr (14.53 MM Btu/hr). The reciprocating internal combustion engine will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with open process flare unit to control landfill gas emissions.

6. DATE OF INSTALLATION OR LAST MODIFICATION OF EQUIPMENT:
New construction

7. RATED HEAT INPUT CAPACITY ( IN MILLION BTU/HOUR ) AND HORSE POWER:

14.53 MM BTUs per Hour / 2233 BHP

STATE WHICH HEATING VALUE WAS UTILIZED:

____X____ HIGHER HEATING VALUE

_____ LOWER HEATING VALUE

8. IF EQUIPMENT IS GAS TURBINE, LIST TYPE. N/A

_____ SIMPLE CYCLE

_____ REGENERATIVE CYCLE

_____ COMBINED CYCLE

9. FUELS:

| | PRIMARY FUEL | BACKUP FUEL #1 | BACKUP FUEL #2 | BACKUP FUEL #3 |
|---|---|---|---|---|
| FUEL NAME | Landfill Gas | N/A | N/A | N/A |
| ACTUAL YEARLY CONSUMPTION | 251.63 MM $sft^3$ | N/A | N/A | N/A |

10. ( FOR NSPS TURBINES ONLY ) MANUFACTURER'S RATED HEAT RATE AT MANUFACTURER'S RATED PEAK LOAD ( KILOJOULES PER WATT HOUR ), OR ACTUAL MEASURED HEAT RATE BASED ON LOWER HEATING VALUE OF FUEL AS MEASURED AT ACTUAL PEAK LOAD FOR THE UNIT:
N/A

11. LOCATION OF THIS FUEL BURNING INSTALLATION IN UTM COORDINATES:

UTM VERTICAL: 634.000 UTM HORIZONTAL: 1,336.500

12. NORMAL OPERATING SCHEDULE:

24 HRS/DAY 7 DAYS/WK 365 DAYS/YR

13. PAGE NUMBER: 8 REVISION NUMBER: DATE OF REVISION:

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STATIONARY GAS TURBINE OR INTERNAL COMBUSTION ENGINE

1. FACILITY NAME:
West Camden Sanitary Landfill

2. LIST ALL GAS TURBINES AND INTERNAL COMBUSTION ENGINES AT THIS FACILITY ON A SEPARATE SHEET, AND PLEASE COMPLETE AN APC V.5 FORM FOR EACH PIECE OF EQUIPMENT.
Reciprocating Internal Combustion Engine (E2)

3. MANUFACTURER AND MODEL NUMBER:
Caterpillar (CAT) G3520C low emissions

4. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION( S ):
E2S

5. EQUIPMENT DESCRIPTION:
Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engine. The engine is rated at 2233 BHP at 100% load, and has a nominal fuel consumption rating of 6509 Btu/bhp-hr (14.53 MM Btu/hr). The reciprocating internal combustion engine will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with open process flare unit to control landfill gas emissions.

6. DATE OF INSTALLATION OR LAST MODIFICATION OF EQUIPMENT:
New construction

7. RATED HEAT INPUT CAPACITY ( IN MILLION BTU/HOUR ) AND HORSE POWER:

14.53 MM BTUs per Hour / 2233 BHP

STATE WHICH HEATING VALUE WAS UTILIZED:

____X____ HIGHER HEATING VALUE

_____ LOWER HEATING VALUE

8. IF EQUIPMENT IS GAS TURBINE, LIST TYPE. N/A

_____ SIMPLE CYCLE

_____ REGENERATIVE CYCLE

_____ COMBINED CYCLE

9. FUELS:

| | PRIMARY FUEL | BACKUP FUEL #1 | BACKUP FUEL #2 | BACKUP FUEL #3 |
|---|---|---|---|---|
| FUEL NAME | Landfill Gas | N/A | N/A | N/A |
| ACTUAL YEARLY CONSUMPTION | 251.63 MM $sft^3$ | N/A | N/A | N/A |

10. ( FOR NSPS TURBINES ONLY ) MANUFACTURER'S RATED HEAT RATE AT MANUFACTURER'S RATED PEAK LOAD ( KILOJOULES PER WATT HOUR ), OR ACTUAL MEASURED HEAT RATE BASED ON LOWER HEATING VALUE OF FUEL AS MEASURED AT ACTUAL PEAK LOAD FOR THE UNIT:
N/A

11. LOCATION OF THIS FUEL BURNING INSTALLATION IN UTM COORDINATES:

UTM VERTICAL: 634.000 UTM HORIZONTAL: 1,336.500

12. NORMAL OPERATING SCHEDULE:

24 HRS/DAY 7 DAYS/WK 365 DAYS/YR

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STATIONARY GAS TURBINE OR INTERNAL COMBUSTION ENGINE

1. FACILITY NAME:
West Camden Sanitary Landfill

2. LIST ALL GAS TURBINES AND INTERNAL COMBUSTION ENGINES AT THIS FACILITY ON A SEPARATE SHEET, AND PLEASE COMPLETE AN APC V.5 FORM FOR EACH PIECE OF EQUIPMENT.
Reciprocating Internal Combustion Engine (E3)

3. MANUFACTURER AND MODEL NUMBER:
Caterpillar (CAT) G3520C low emissions

4. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION( S ):
E3S

5. EQUIPMENT DESCRIPTION:
Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engine. The engine is rated at 2233 BHP at 100% load, and has a nominal fuel consumption rating of 6509 Btu/bhp-hr (14.53 MM Btu/hr). The reciprocating internal combustion engine will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with open process flare unit to control landfill gas emissions.

6. DATE OF INSTALLATION OR LAST MODIFICATION OF EQUIPMENT:
New construction

7. RATED HEAT INPUT CAPACITY ( IN MILLION BTU/HOUR ) AND HORSE POWER:

14.53 MM BTUs per Hour / 2233 BHP

STATE WHICH HEATING VALUE WAS UTILIZED:

____X____ HIGHER HEATING VALUE

_____ LOWER HEATING VALUE

8. IF EQUIPMENT IS GAS TURBINE, LIST TYPE. N/A

_____ SIMPLE CYCLE

_____ REGENERATIVE CYCLE

_____ COMBINED CYCLE

9. FUELS:

| | PRIMARY FUEL | BACKUP FUEL #1 | BACKUP FUEL #2 | BACKUP FUEL #3 |
|---|---|---|---|---|
| FUEL NAME | Landfill Gas | N/A | N/A | N/A |
| ACTUAL YEARLY CONSUMPTION | 251.63 MM $sft^3$ | N/A | N/A | N/A |

10. ( FOR NSPS TURBINES ONLY ) MANUFACTURER'S RATED HEAT RATE AT MANUFACTURER'S RATED PEAK LOAD ( KILOJOULES PER WATT HOUR ), OR ACTUAL MEASURED HEAT RATE BASED ON LOWER HEATING VALUE OF FUEL AS MEASURED AT ACTUAL PEAK LOAD FOR THE UNIT:
N/A

11. LOCATION OF THIS FUEL BURNING INSTALLATION IN UTM COORDINATES:

UTM VERTICAL: 634.000 UTM HORIZONTAL: 1,336.500

12. NORMAL OPERATING SCHEDULE:

24 HRS/DAY 7 DAYS/WK 365 DAYS/YR

13. PAGE NUMBER: 10 REVISION NUMBER: DATE OF REVISION:

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STACK IDENTIFICATION

| | | |
|---|---|---|
| 1. FACILITY NAME: West Camden Sanitary Landfill | FOR APC USE ONLY | APC COMPANY NO. |
| 2. STACK ID ( OR FLOW DIAGRAM POINT IDENTIFICATION ): Reciprocating Internal Combustion Engine (E1S) | | LOG/PERMIT NO. |

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. STACK HEIGHT ABOVE GRADE IN FEET:
21.0

| | |
|---|---|
| 5. VELOCITY ( DATA AT EXIT CONDITIONS ): _____192.5_____ ( ACTUAL FEET PER SECOND ) | 6. INSIDE DIMENSIONS AT OUTLET IN FEET: 1.17 |
| 7. EXHAUST FLOW RATE AT EXIT CONDITIONS ( ACFM ): 12,476 | 8. FLOW RATE AT STANDARD CONDITIONS (DSCFM): 4,869 |
| 9. EXHAUST TEMPERATURE: _____898_____ DEGREES FAHRENHEIT ( °F ) | 10. MOISTURE CONTENT (DATA AT EXIT CONDITIONS): _____N/A_____ PERCENT _____ GRAINS PER DRY STANDARD CUBIC FOOT (gr/dscf) |

11. EXHAUST TEMPERATURE THAT IS EQUALED OR EXCEEDED DURING NINETY ( 90 ) PERCENT OR MORE OF THE OPERATING TIME ( FOR STACKS SUBJECT TO DIFFUSION EQUATION ONLY ):
N/A
_____ ( °F )

12. IF THIS STACK IS EQUIPPED WITH CONTINUOUS POLLUTANT MONITORING EQUIPMENT REQUIRED FOR COMPLIANCE, WHAT POLLUTANT(S) DOES THIS EQUIPMENT MONITOR ( e.g., OPACITY, $SO_2$ , $NO_X$ , etc. )?
N/A

COMPLETE THE APPROPRIATE APC FORM(S) V.4, V.5, V.7, V.8, V.9, OR V.10 FOR EACH SOURCE EXHAUSTING THROUGH THIS STACK.

13. DO YOU HAVE A BYPASS STACK?
_____ YES ____X____ NO

IF YES, DESCRIBE THE CONDITIONS WHICH REQUIRE ITS USE & COMPLETE APC FORM V.3 FOR THE BYPASS STACK. PLEASE IDENTIFY THE STACK NUMBER( S ) OR FLOW DIAGRAM POINT NUMBER( S ) EXHAUSTING THROUGH THIS BYPASS STACK.

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STACK IDENTIFICATION

| | | |
|---|---|---|
| 1. FACILITY NAME: West Camden Sanitary Landfill | FOR APC USE ONLY | APC COMPANY NO. |
| 2. STACK ID ( OR FLOW DIAGRAM POINT IDENTIFICATION ): Reciprocating Internal Combustion Engine (E2S) | | LOG/PERMIT NO. |

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. STACK HEIGHT ABOVE GRADE IN FEET:
21.0

| | |
|---|---|
| 5. VELOCITY ( DATA AT EXIT CONDITIONS ): _____192.5_____ ( ACTUAL FEET PER SECOND ) | 6. INSIDE DIMENSIONS AT OUTLET IN FEET: 1.17 |
| 7. EXHAUST FLOW RATE AT EXIT CONDITIONS ( ACFM ): 12,476 | 8. FLOW RATE AT STANDARD CONDITIONS (DSCFM): 4,869 |
| 9. EXHAUST TEMPERATURE: _____898_____ DEGREES FAHRENHEIT ( °F ) | 10. MOISTURE CONTENT (DATA AT EXIT CONDITIONS): _____N/A_____ PERCENT _____ GRAINS PER DRY STANDARD CUBIC FOOT (gr/dscf) |

11. EXHAUST TEMPERATURE THAT IS EQUALED OR EXCEEDED DURING NINETY ( 90 ) PERCENT OR MORE OF THE OPERATING TIME ( FOR STACKS SUBJECT TO DIFFUSION EQUATION ONLY ):
N/A
_____ ( °F )

12. IF THIS STACK IS EQUIPPED WITH CONTINUOUS POLLUTANT MONITORING EQUIPMENT REQUIRED FOR COMPLIANCE, WHAT POLLUTANT(S) DOES THIS EQUIPMENT MONITOR ( e.g., OPACITY, $SO_2$ , $NO_X$ , etc. )?
N/A

COMPLETE THE APPROPRIATE APC FORM(S) V.4, V.5, V.7, V.8, V.9, OR V.10 FOR EACH SOURCE EXHAUSTING THROUGH THIS STACK.

13. DO YOU HAVE A BYPASS STACK?
_____ YES ____X____ NO

IF YES, DESCRIBE THE CONDITIONS WHICH REQUIRE ITS USE & COMPLETE APC FORM V.3 FOR THE BYPASS STACK. PLEASE IDENTIFY THE STACK NUMBER( S ) OR FLOW DIAGRAM POINT NUMBER( S ) EXHAUSTING THROUGH THIS BYPASS STACK.

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STACK IDENTIFICATION

| | | |
|---|---|---|
| 1. FACILITY NAME: West Camden Sanitary Landfill | FOR APC USE ONLY | APC COMPANY NO. |
| 2. STACK ID ( OR FLOW DIAGRAM POINT IDENTIFICATION ): Reciprocating Internal Combustion Engine (E3S) | | LOG/PERMIT NO. |

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. STACK HEIGHT ABOVE GRADE IN FEET:
21.0

| | |
|---|---|
| 5. VELOCITY ( DATA AT EXIT CONDITIONS ): _____192.5_____ ( ACTUAL FEET PER SECOND ) | 6. INSIDE DIMENSIONS AT OUTLET IN FEET: 1.17 |
| 7. EXHAUST FLOW RATE AT EXIT CONDITIONS ( ACFM ): 12,476 | 8. FLOW RATE AT STANDARD CONDITIONS (DSCFM): 4,869 |
| 9. EXHAUST TEMPERATURE: _____898_____ DEGREES FAHRENHEIT ( °F ) | 10. MOISTURE CONTENT (DATA AT EXIT CONDITIONS): _____N/A_____ PERCENT _____ GRAINS PER DRY STANDARD CUBIC FOOT (gr/dscf) |

11. EXHAUST TEMPERATURE THAT IS EQUALED OR EXCEEDED DURING NINETY ( 90 ) PERCENT OR MORE OF THE OPERATING TIME ( FOR STACKS SUBJECT TO DIFFUSION EQUATION ONLY ):
N/A
_____ ( °F )

12. IF THIS STACK IS EQUIPPED WITH CONTINUOUS POLLUTANT MONITORING EQUIPMENT REQUIRED FOR COMPLIANCE, WHAT POLLUTANT(S) DOES THIS EQUIPMENT MONITOR ( e.g., OPACITY, $SO_2$ , $NO_X$ , etc. )?
N/A

COMPLETE THE APPROPRIATE APC FORM(S) V.4, V.5, V.7, V.8, V.9, OR V.10 FOR EACH SOURCE EXHAUSTING THROUGH THIS STACK.

13. DO YOU HAVE A BYPASS STACK?
_____ YES ____X____ NO

IF YES, DESCRIBE THE CONDITIONS WHICH REQUIRE ITS USE & COMPLETE APC FORM V.3 FOR THE BYPASS STACK. PLEASE IDENTIFY THE STACK NUMBER( S ) OR FLOW DIAGRAM POINT NUMBER( S ) EXHAUSTING THROUGH THIS BYPASS STACK.

| 14. PAGE NUMBER: | REVISION NUMBER: | DATE OF REVISION |
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# COMPLIANCE CERTIFICATION - MONITORING AND REPORTING
## DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE

ALL SOURCES THAT ARE SUBJECT TO 1200-3-9-.02(11) OF TENNESSEE AIR POLLUTION CONTROL REGULATIONS ARE REQUIRED TO CERTIFY COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS BY INCLUDING A STATEMENT WITHIN THE PERMIT APPLICATION OF THE METHODS USED FOR DETERMINING COMPLIANCE. THIS STATEMENT MUST INCLUDE A DESCRIPTION OF THE MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS AND TEST METHODS. IN ADDITION, THE APPLICATION MUST INCLUDE A SCHEDULE FOR COMPLIANCE CERTIFICATION SUBMITTALS DURING THE PERMIT TERM. THESE SUBMITTALS MUST BE NO LESS FREQUENT THAN ANNUALLY AND MAY NEED TO BE MORE FREQUENT IF SPECIFIED BY THE UNDERLYING APPLICABLE REQUIREMENT OR THE TECHNICAL SECRETARY.

1. FACILITY NAME:
West Camden Sanitary Landfill

2. PROCESS EMISSION SOURCE, FUEL BURNING INSTALLATION, OR INCINERATOR (IDENTIFY):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

3. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ):
Reciprocating Internal Combustion Engine (E1S)
Reciprocating Internal Combustion Engine (E2S)
Reciprocating Internal Combustion Engine (E3S)

4. THIS SOURCE AS DESCRIBED UNDER ITEM #2 OF THIS APPLICATION WILL USE THE FOLLOWING METHOD(S) FOR DETERMINING COMPLIANCE WITH APPLICABLE REQUIREMENTS (AND SPECIAL OPERATING CONDITIONS FROM AN EXISTING PERMIT). CHECK ALL THAT APPLY AND ATTACH THE APPROPRIATE FORM(S).

_____ CONTINUOUS EMISSIONS MONITORING (CEM) - APC FORM V.20
POLLUTANT(S): N/A

_____ EMISSION MONITORING USING PORTABLE MONITORS - APC FORM V.21
POLLUTANT(S): N/A

_____ MONITORING CONTROL SYSTEM PARAMETERS OR OPERATING PARAMETERS OF A PROCESS - APC FORM V.22
POLLUTANT(S): N/A

___X___ MONITORING MAINTENANCE PROCEDURES - APC FORM V.23
POLLUTANT(S): Maintenance Plan

____X__ STACK TESTING - APC FORM V.24
POLLUTANT(S): NOx, CO, VOC

_____ FUEL SAMPLING & ANALYSIS (FSA) - APC FORM V.25
POLLUTANT(S): N/A

____X__ RECORDKEEPING - APC FORM V.26
POLLUTANT(S): Maintenance, Notifications

_____ OTHER (PLEASE DESCRIBE) - APC FORM V.27
POLLUTANT(S): N/A

5. COMPLIANCE CERTIFICATION REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE.

START DATE: In accordance with the Title V Major Source Operating Permit
AND EVERY 365 DAYS THEREAFTER.

6. COMPLIANCE MONITORING REPORTS WILL BE SUBMITTED TO THE DIVISION ACCORDING TO THE FOLLOWING SCHEDULE:

START DATE: In accordance with the Title V Major Source Operating Permit
AND EVERY 365 DAYS THEREAFTER.

7. PAGE NUMBER: 14 REVISION NUMBER: DATE OF REVISION:

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
# COMPLIANCE DEMONSTRATION BY MONITORING MAINTENANCE PROCEDURES

THE MONITORING OF A MAINTENANCE PROCEDURE SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PROCEDURE AND THE EMISSION RATE OF A PARTICULAR POLLUTANT IS ESTABLISHED.

1. FACILITY NAME:
West Camden Sanitary Landfill

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ):
E1S, E2S, E3S

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)
*Engines E1, E2 & E3 requirements[1]

4. POLLUTANT( S ) BEING MONITORED:
N/A

5. PROCEDURE BEING MONITORED:
N/A

6. DESCRIPTION OF THE METHOD OF MONITORING AND ESTABLISHMENT OF CORRELATION BETWEEN THE PROCEDURE AND THE EMISSION RATE OF A PARTICULAR POLLUTANT:

Keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions.

7. COMPLIANCE DEMONSTRATION FREQUENCY ( SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED ):

8. PAGE NUMBER: 15 REVISION NUMBER: DATE OF REVISION:



[1] Requirements for owner/operators of noncertified engine Subpart JJJJ requirements.

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
# COMPLIANCE DEMONSTRATION BY STACK TESTING

THE PERFORMANCE OF AN APPROPRIATE EPA STACK TEST METHOD FOR DEMONSTRATING COMPLIANCE WITH AN EMISSION LIMITATION HAS ALWAYS BEEN ACCEPTABLE. EPA TEST METHODS CONTAIN QUALITY ASSURANCE PROCEDURES THAT SHALL BE STRICTLY ADHERED TO BY THE SOURCE.

1. FACILITY NAME:
   West Camden Sanitary Landfill

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ):
   E1S, E2S, E3S

3. EMISSION SOURCE ( IDENTIFY ):
   Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. POLLUTANT( S ) BEING MONITORED:
   NOx, CO, VOC

5. TEST METHOD:
   Test methods in accordance with Subpart JJJJ; 40 CFR Part 60, §60.4244.

6. COMPLIANCE DEMONSTRATION FREQUENCY ( SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED ):
   Initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## COMPLIANCE DEMONSTRATION BY RECORDKEEPING

RECORDKEEPING SHALL BE ACCEPTABLE AS A COMPLIANCE DEMONSTRATION METHOD PROVIDED THAT A CORRELATION BETWEEN THE PARAMETER VALUE RECORDED AND THE APPLICABLE REQUIREMENT IS ESTABLISHED

1. FACILITY NAME:
West Camden Sanitary Landfill

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ):
E1S, E2S, E3S

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. POLLUTANT( S ) OR PARAMETER BEING MONITORED:
NOx, CO, VOC

5. MATERIAL OR PARAMETER BEING MONITORED AND RECORDED:
Notifications
Maintenance
Documentation that the engine meets the emission standards

6. METHOD OF MONITORING AND RECORDING:

All notifications submitted to comply with this subpart and all documentation supporting any notification
Maintenance conducted on the engines
Documentation that the engine meets the emission standards.

7. COMPLIANCE DEMONSTRATION FREQUENCY ( SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED ):
Records maintained for 5 years

8. PAGE NUMBER: 17 REVISION NUMBER: DATE OF REVISION

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## COMPLIANCE DEMONSTRATION BY OTHER METHOD(S)

| | |
|---|---|
| 1. FACILITY NAME:<br>West Camden Sanitary Landfill | 2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ):<br>E1S, E2S, E3S |

3. EMISSION SOURCE ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. POLLUTANT( S ) OR PARAMETER BEING MONITORED:
Opacity

5. DESCRIPTION OF THE METHOD OF MONITORING:

Opacity checks will be done in accordance with the Tennessee Opacity Matrix – Utilizing Method 2

6. COMPLIANCE DEMONSTRATION FREQUENCY ( SPECIFY THE FREQUENCY WITH WHICH COMPLIANCE WILL BE DEMONSTRATED ):
In accordance with the Tennessee Opacity Matrix – once per 5 yr period

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

| | |
|---|---|
| 1. FACILITY NAME: West Camden Sanitary Landfill | 2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ): E1S, E2S, E3S |

3. PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS. FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

| AIR POLLUTANT | MAXIMUM ALLOWABLE EMISSIONS | | ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 7, APC V.30 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 8, APC V.30 ) |
| PARTICULATES ( TSP ) | N/A | | 9.06 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| SULFUR DIOXIDE | N/A | | 31.86 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| VOLATILE ORGANIC COMPOUNDS | N/A | | 12.35 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| CARBON MONOXIDE | N/A | | 226.20 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| LEAD | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| NITROGEN OXIDES | N/A | | 38.78 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| TOTAL REDUCED SULFUR | N/A | | Included in $SO_2$ | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| MERCURY | N/A | | 0.00006 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |

( CONTINUED ON NEXT PAGE )



[1] Emissions of this pollutant are assumed negligible from municipal solid waste landfills.

( CONTINUED FROM LAST PAGE )

| AIR POLLUTANT | MAXIMUM ALLOWABLE EMISSIONS | | ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 7, APC V.30 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 8, APC V.30 ) |
| ASBESTOS | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| BERYLLIUM | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| VINYL CHLORIDE | N/A | | 0.0047 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| FLUORIDES | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| GASEOUS FLUORIDES | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| | | | | |
| | | | | |
| | | | | |

5. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT ( S ). FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

| AIR POLLUTANT & CAS | MAXIMUM ALLOWABLE EMISSIONS | | ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 7, APC V.30 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 8, APC V.30 ) |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

6. PAGE NUMBER: 19 & 20 REVISION NUMBER: DATE OF REVISION



[1] Emissions of this pollutant are assumed negligible from municipal solid waste landfills per AP-42, Section 2.4.

*Appendix B*
*Emission Rate Calculations*

**Title V Permit No. 556483** **Waste Management - West Camden Sanitary Landfill**

**Renewable Energy Project**

**Potential Emissions Summary**

| | Open Flare (OF1S) | | E1S, E2S, E3S (new engines) | | Total of All Point Sources | |
|---|---|---|---|---|---|---|
| **HAPs Identified** | **HAP Emissions (lb/hr)** | **HAP Emissions (tons/yr)** | **HAP Emissions (lb/hr)** | **HAP Emissions (tons/yr)** | **HAP Emissions (lb/hr)** | **HAP Emissions (tons/yr)** |
| 1,1,1-Trichloroethane (methylchloroform) | 0.00028 | 0.00124 | 0.00032 | 0.00156 | 0.00061 | 0.00280 |
| 1,1,2,2-Tetrachloroethane | 0.00015 | 0.00065 | 0.00017 | 0.00082 | 0.00032 | 0.00147 |
| 1,1-Dichloroethane (ethylidene dichloride) | 0.00014 | 0.00061 | 0.00042 | 0.00204 | 0.00056 | 0.00265 |
| 1,1-Dichloroethene(vinylidene chloride) | 0.00011 | 0.00049 | 0.00013 | 0.00062 | 0.00024 | 0.00111 |
| 1,2-Dichloroethane (ethylene dichloride) | 0.00015 | 0.00066 | 0.00017 | 0.00083 | 0.00032 | 0.00148 |
| 1,2-Dichloropropane (propylene dichloride) | 0.00003 | 0.00014 | 0.00004 | 0.00018 | 0.00007 | 0.00032 |
| Acrylonitrile | 0.00000 | 0.00002 | 0.00001 | 0.00005 | 0.00001 | 0.00007 |
| Benzene - Co-Disposal | 0.00154 | 0.00673 | 0.00468 | 0.02257 | 0.00622 | 0.02930 |
| Carbon disulfide | 0.00005 | 0.00020 | 0.00014 | 0.00068 | 0.00019 | 0.00088 |
| Carbon tetrachloride | 0.00001 | 0.00006 | 0.00002 | 0.00007 | 0.00003 | 0.00013 |
| Carbonyl sulfide | 0.00002 | 0.00009 | 0.00006 | 0.00031 | 0.00008 | 0.00040 |
| Chlorobenzene | 0.00032 | 0.00142 | 0.00037 | 0.00178 | 0.00069 | 0.00319 |
| Chloroethane (ethyl chloride) | 0.00020 | 0.00085 | 0.00022 | 0.00107 | 0.00042 | 0.00193 |
| Chloroform | 0.00003 | 0.00014 | 0.00004 | 0.00017 | 0.00007 | 0.00031 |
| Dichlorobenzene | 0.00299 | 0.01309 | 0.00341 | 0.01645 | 0.00640 | 0.02953 |
| Dichloromethane (methylenechloride) | 0.00365 | 0.01597 | 0.00417 | 0.02008 | 0.00781 | 0.03605 |
| Ethylbenzene | 0.00137 | 0.00599 | 0.00417 | 0.02007 | 0.00553 | 0.02606 |
| Ethylene dibromide (1,2 Dibromoethane) | 0.00011 | 0.00048 | 0.00012 | 0.00060 | 0.00023 | 0.00108 |
| Hexane | 0.00038 | 0.00166 | 0.00116 | 0.00558 | 0.00154 | 0.00724 |
| Mercury (total) | 0.00004 | 0.00016 | 0.00001 | 0.00006 | 0.00005 | 0.00022 |
| Methyl isobutyl ketone | 0.00014 | 0.00062 | 0.00043 | 0.00209 | 0.00058 | 0.00272 |
| Perchloroethylene (tetrachloroethylene) | 0.00250 | 0.01096 | 0.00286 | 0.01377 | 0.00536 | 0.02473 |
| Toluene | 0.00655 | 0.02867 | 0.01995 | 0.09610 | 0.02649 | 0.12477 |
| Trichloroethylene (trichloroethene) | 0.00113 | 0.00496 | 0.00129 | 0.00623 | 0.00242 | 0.01119 |
| Vinyl chloride | 0.00085 | 0.00373 | 0.00097 | 0.00469 | 0.00182 | 0.00842 |
| Xylenes (mixed isomers) | 0.00334 | 0.01463 | 0.01017 | 0.04902 | 0.01351 | 0.06365 |
| **Totals** | 0.02608 | 0.11424 | 0.05552 | 0.26749 | 0.08160 | 0.38173 |
| | | | | | | |
| Hydrochloric Acid (HCl) | 0.96810 | 4.24027 | 0.31602 | 1.52259 | 1.28412 | 5.76286 |
| | | | | | | |
| | | | | | Total HAPs | 6.14458 |

**Criteria Pollutants**

| | Open Flare (OF1S) | | E1S, E2S, E3S (new engines) | | Total of All Point Sources | |
|---|---|---|---|---|---|---|
| | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** |
| NOx | 7.91 | 34.67 | 8.85 | 38.78 | 16.77 | 73.44 |
| CO | 43.07 | 188.63 | 51.64 | 226.20 | 94.71 | 414.83 |
| $PM/PM_{10}/PM_{2.5}$ | 2.04 | 8.93 | 2.07 | 9.06 | 4.11 | 17.99 |
| $SO_2$ | 20.25 | 88.72 | 6.61 | 31.86 | 26.87 | 120.57 |
| VOC (engine max. based on 1.0 g/hp-hr) | | | 14.76 | | 14.76 | |
| VOC (annual) | 0.11 | 0.47 | | 12.35 | | 12.83 |

**Note:**

1) The VOC max. hourly for the engines is 1.0 gr/hp-hr per Subpart JJJJ.

2) The VOC engine PTE is based on 20 ppmv (7% $O_2$) in engine exhaust.

**Title V Permit No. 556483**

**Waste Management - West Camden Sanitary Landfill**
**Renewable Energy Project**
**E1S, E2S, E3S Reciprocating Internal Combustion Engines Criteria Pollutant Emission Calculations**

**Engine Data**

| Parameter | | Units | | Parameter | | Units |
|---|---|---|---|---|---|---|
| CAT G3520C BHP | 2,233 | Bhp | | Methane HHV | 1,012 | Btu/cf |
| Fuel Consumption | 6,354 | Btu/bhp-hr | (ISO) | LFG Concentration | 55% | lb/hr basis |
| Fuel Consumption | 6,509 | Btu/bhp-hr | (Nominal) | LFG Concentration | 50% | annual basis |
| Nominal Fuel Heat Rating | 14,534,597 | Btu/hr | (Nominal) | LFG Heat value | 506 | Btu/cf |
| Nominal Fuel Heat Rating | 14.53 | MM Btu/hr | (Nominal) | Engine Exhaust Flow | 3,450 | dscfm (7% $O_2$) |
| LFG Flowrate (required to meet the max. heat input) | 26,113 | cf/hr | 435 | cfm | **lb/hr basis** | |
| $CH_4$ Flowrate | 14,362 | cf/hr | 239 | cfm | **lb/hr basis** | |
| | | | | | | **Annual Consumption** / **Unit** |
| LFG Flowrate | 28,725 | cf/hr | 479 | cfm | **annual basis** | 251.63 / MM cf |
| $CH_4$ Flowrate | 14,362 | cf/hr | 239 | cfm | **annual basis** | |

**Methane Values**

**(1)(2)(3) Engine Emission Factors**

| | | | | | |
|---|---|---|---|---|---|
| NOx | 0.6 | g/bhp-hr | TRS | 500 | ppmv (in-flow as $H_2S$) |
| CO | 3.5 | g/bhp-hr | VOC | 1.0 | g/bhp-hr (outlet) |
| $PM/PM_{10}/PM_{2.5}$ | 48 | lb/MMcf Methane | VOC | 20.0 | ppmv - annual basis, 7% $O_2$ |

**notes:**
1) Emission Factors for $SO_2$ are based on 500 ppmv of TRS (primarily $H_2S$) in the LFG.
2) PM EF per AP-42, Table 2.4-5; all is assumed $PM_{2.5}$.
3) 1.0 gr per Hpr-hr for VOC per Subpart JJJJ assumed as maximum VOC hourly concentration.
4) Engine exhaust flow estimated at 7% O2 per Caterpillar specifications.

**(1)(2)(3) Criteria Pollutant Emissions For CAT G3520C Engines**
*(calculations are for Nominal fuel consumption per engine)*

| | | | | | Per Engine Basis | | Total of Three Engines | | |
|---|---|---|---|---|---|---|---|---|---|
| | **E.F.** | **Units** | **Molecular Weight (lb/lb-mol)** | **Destruction Efficiency %** | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** | **-3 Engines - Emission Rate (lb/hr)** | **- 3 Engines - Emission Rate (ton/yr)** | **Comment(s)** |
| NOx | 0.6 | g/bhp-hr | - | - | 2.95 | 12.93 | 8.85 | 38.78 | |
| CO | 3.5 | g/bhp-hr | - | - | 17.21 | 75.40 | 51.64 | 226.20 | |
| $PM/PM_{10}/PM_{2.5}$ | 48.0 | lb/MMcf Methane | - | - | 0.69 | 3.02 | 2.07 | 9.06 | |
| $SO_2$ | 500 | ppm ($H_2S$ in) | 64.06 | - | 2.20 | 10.62 | 6.61 | 31.86 | 55% $CH_4$ on lb/hr, 50% $CH_4$ annual basis |
| VOC | 1.0 | g/bhp-hr (outlet) | | - | 4.92 | - | 14.76 | - | |
| VOC (annual basis) | 20.0 | ppmv @ 7% $O_2$ (hexane) | 86.18 | - | 0.94 | 4.12 | 2.82 | 12.35 | |

**notes:**
1) 379.50 cf/lb-mole @ standard conditions
2) 55% CH4 on lb/hr, 50% CH4 annual basis. Based on engine heat requirement more LFG is required to fuel the engine at the 50% annual CH4 concentration.
3) Total reduced sulfur (TRS) concentration is considered primarily $H_2S$. 500 ppmv is the estimated maximum content of the LFG.
4) Annual Engine VOC annual emissions are based on 20 ppmv @ 7% $O_2$ in engine exhaust.

Title V Permit No. 556483

## Waste Management - West Camden Sanitary Landfill
## Renewable Energy Project
## E1S, E2S, E3S Reciprocating Internal Combustion Engines HAPs Pollutant Emission Calculations

| | | | | | Per Engine | | Three Engines (total) | |
|---|---|---|---|---|---|---|---|---|
| HAPs Identified [1], [2], [3], [4] | CAS Number | Molecular Weight (lbm/lbmol) | Average Concentration of LFG (ppmv) | [6] Engine Destruction Efficiency % | HAP Emissions (lb/hr) | HAP Emissions (tons/yr) | HAP Emissions (lb/hr) | HAP Emissions (tons/yr) |
| 1,1,1-Trichloroethane (methylchloroform) | 71-55-6 | 133.41 | 0.168 | 93.0% | 0.00011 | 0.00052 | 0.00032 | 0.00156 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 167.85 | 0.070 | 93.0% | 0.00006 | 0.00027 | 0.00017 | 0.00082 |
| 1,1-Dichloroethane (ethylidene dichloride) | 75-34-3 | 98.97 | 0.741 | 97.2% | 0.00014 | 0.00068 | 0.00042 | 0.00204 |
| 1,1-Dichloroethene(vinylidene chloride) | 75-35-4 | 96.94 | 0.092 | 93.0% | 0.00004 | 0.00021 | 0.00013 | 0.00062 |
| 1,2-Dichloroethane (ethylene dichloride) | 107-06-2 | 98.96 | 0.120 | 93.0% | 0.00006 | 0.00028 | 0.00017 | 0.00083 |
| 1,2-Dichloropropane (propylene dichloride) | 78-87-5 | 112.99 | 0.023 | 93.0% | 0.00001 | 0.00006 | 0.00004 | 0.00018 |
| Acrylonitrile | 107-13-1 | 53.06 | 0.036 | 97.2% | 0.00000 | 0.00002 | 0.00001 | 0.00005 |
| Benzene - Co-Disposal | 71-43-2 | 78.11 | 10.376 | 97.2% | 0.00156 | 0.00752 | 0.00468 | 0.02257 |
| Carbon disulfide | 75-15-0 | 76.13 | 0.320 | 97.2% | 0.00005 | 0.00023 | 0.00014 | 0.00068 |
| Carbon tetrachloride | 56-23-5 | 153.84 | 0.007 | 93.0% | 5.187E-06 | 2.499E-05 | 0.00002 | 0.00007 |
| Carbonyl sulfide | 463-58-1 | 60.07 | 0.183 | 97.2% | 0.00002 | 0.00010 | 0.00006 | 0.00031 |
| Chlorobenzene | 108-90-7 | 112.56 | 0.227 | 93.0% | 0.00012 | 0.00059 | 0.00037 | 0.00178 |
| Chloroethane (ethyl chloride) | 75-00-3 | 64.52 | 0.239 | 93.0% | 0.00007 | 0.00036 | 0.00022 | 0.00107 |
| Chloroform | 67-66-3 | 119.39 | 0.021 | 93.0% | 1.208E-05 | 0.00006 | 0.00004 | 0.00017 |
| Dichlorobenzene | 50-1, 541-73-1, 106-4 | 147.00 | 1.607 | 93.0% | 0.00114 | 0.00548 | 0.00341 | 0.01645 |
| Dichloromethane (methylenechloride) | 75-09-2 | 84.94 | 3.395 | 93.0% | 0.00139 | 0.00669 | 0.00417 | 0.02008 |
| Ethylbenzene | 100-41-4 | 106.16 | 6.789 | 97.2% | 0.00139 | 0.00669 | 0.00417 | 0.02007 |
| Ethylene dibromide (1,2 Dibromoethane) | 106-93-4 | 187.88 | 0.046 | 93.0% | 4.163E-05 | 2.006E-04 | 0.00012 | 0.00060 |
| Hexane | 110-54-3 | 86.18 | 2.324 | 97.2% | 0.00039 | 0.00186 | 0.00116 | 0.00558 |
| Mercury (total) | 7439-97-6 | 200.61 | 2.920E-04 | 0.0% | 4.031E-06 | 1.942E-05 | 0.00001 | 0.00006 |
| Methyl isobutyl ketone | 108-10-1 | 100.16 | 0.750 | 97.2% | 0.00014 | 0.00070 | 0.00043 | 0.00209 |
| Perchloroethylene (tetrachloroethylene) | 127-18-4 | 165.83 | 1.193 | 93.0% | 0.00095 | 0.00459 | 0.00286 | 0.01377 |
| Toluene | 108-88-3 | 92.13 | 37.456 | 97.2% | 0.00665 | 0.03203 | 0.01995 | 0.09610 |
| Trichloroethylene (trichloroethene) | 79-01-6 | 131.40 | 0.681 | 93.0% | 0.00043 | 0.00208 | 0.00129 | 0.00623 |
| Vinyl chloride | 75-01-4 | 62.50 | 1.077 | 93.0% | 0.00032 | 0.00156 | 0.00097 | 0.00469 |
| Xylenes (mixed isomers) | 1330-20-7 | 106.16 | 16.582 | 97.2% | 0.00339 | 0.01634 | 0.01017 | 0.04902 |
| | | | | **Totals** | 0.01851 | 0.08916 | 0.05552 | 0.26749 |
| | | | | | | | | |
| [5] Hydrochloric Acid (HCl) | 7647-01-0 | 36.45 | 42.000 | 0.0% | 0.10534 | 0.50753 | 0.31602 | 1.52259 |
| | | | | | | | Total HAPs | 1.79008 |

**Engine Operational Calculations [2]**

| | | | | | |
|---|---|---|---|---|---|
| LFG Flowrate | 26,113.18 | cf/hr | 435.22 | cfm | lb/hr basis |
| LFG Flowrate | 28,724.50 | cf/hr | 478.74 | cfm | annual basis |
| $CH_4$ Flowrate | 14,362.25 | cf/hr | 239.37 | cfm | annual basis |

*(calculations are for Nominal fuel consumption per the CAT G3520C Technical Data sheet.)*

**notes:**

1) 379.50 cf/lb-mole @ standard conditions
2) 55% CH4 on lb/hr, 50% CH4 annual basis. Based on engine heat requirement more LFG is required to fuel the engine at the 50% annual CH4 concentration.
3) HAPs concentration in LFG is per WIAC factors. HCl and Mercury are par AP-42 Section 2.4.
4) HCL occurs from combustion of chlorinated compounds per AP-42, Section 2.4.
5) No destruction efficiency is assumed for mercury and HCL
6) Engine destruction efficiency per AP-42, Table 2.4-3.

**Example Calculations:**

*lb/hr basis:*

HCl
Landfill Gas Emissions From Flare = (Molecular Weight Of Compound[lbm/lbmol]) * (Concentration Of Compound[ppmv]) * ( Landfill Gas ToICE [cuft/hr (*55% CH4 basis)* ])
/ (1,000,000 * 379.5 [cuft/lbmole] @ STP)

*Annual basis:*

Vinyl Chloride
Landfill Gas Emissions From Flare = [(Molecular Weight Of Compound[lbm/lbmol]) * (Concentration Of Compound[ppmv]) * ( Landfill Gas To ICE [cuft/hr (*50% CH4 basis)* ])
/ (1,000,000 * 379.5 [cuft/lbmole] @ STP)] * (8,760/2000) * (1 - 93% *destruction efficiency* )

*Appendix C*
*Caterpillar G3520 C Specification Sheet*

# G3520C

## GAS ENGINE TECHNICAL DATA

CATERPILLAR®

| | | | |
|---|---|---|---|
| ENGINE SPEED: | 1200 | FUEL: | LOW ENERGY (1.43 CH4:CO2 RATIO) |
| COMPRESSION RATIO: | 11.3:1 | FUEL SYSTEM: | CAT LOW PRESSURE WITH AIR FUEL RATIO CONTROL |
| AFTERCOOLER - STAGE 1 MAX. INLET (°F): | 218 | FUEL PRESS. RANGE (PSIG): | 1.5 - 5.0 |
| AFTERCOOLER - STAGE 2 MAX. INLET (°F): | 130 | MIN. METHANE NUMBER: | 135 |
| JACKET WATER - MAX. OUTLET (°F): | 230 | RATED ALTITUDE (FT): | 1378 |
| COOLING SYSTEM: | JW+1AC, OC+2AC | AT AIR TO TURBO. TEMP. (°F): | 77 |
| IGNITION SYSTEM: | ADEM3 | NOx EMISSION LEVEL: | 0.5 g/bhp-hr |
| SPARK PLUG TYPE: | J-GAP | FUEL LHV (BTU/SCF): | 456 |
| EXHAUST MANIFOLD: | DRY | APPLICATION: | GENSET |
| COMBUSTION: | LOW EMISSION | | |

| RATING AND EFFICIENCY | | NOTES | LOAD | 100% | 75% | 50% |
|---|---|---|---|---|---|---|
| ENGINE POWER | (WITHOUT FAN) | (1) | BHP | 2233 | 1675 | 1116 |
| GENERATOR POWER | (WITHOUT FAN) | (2) | EKW | 1600 | 1200 | 800 |
| **ENGINE EFFICIENCY** | **(ISO 3046/1)** | **(3)** | **%** | **40.1** | **38.6** | **36.1** |
| ENGINE EFFICIENCY | (NOMINAL) | (3) | % | 39.1 | 37.7 | 35.2 |
| THERMAL EFFICIENCY | (NOMINAL) | (4) | % | 41.3 | 40.6 | 42.2 |
| TOTAL EFFICIENCY | (NOMINAL) | (5) | % | 80.4 | 78.3 | 77.4 |

| ENGINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| **FUEL CONSUMPTION** | **(ISO 3046/1)** | **(6)** | **BTU/bhp-hr** | **6354** | **6592** | **7047** |
| FUEL CONSUMPTION | (NOMINAL) | (6) | BTU/bhp-hr | 6509 | 6753 | 7219 |
| AIR FLOW (77 °F, 14.7 psi) | | (7) | SCFM | 4512 | 3415 | 2286 |
| AIR FLOW | | (7) | lb/hr | 20006 | 15141 | 10136 |
| COMPRESSOR OUT PRESSURE | | | in. HG (abs) | 105.8 | 80.8 | 55.5 |
| COMPRESSOR OUT TEMPERATURE | | | °F | 375 | 306 | 220 |
| AFTERCOOLER AIR OUT TEMPERATURE | | | °F | 142 | 138 | 135 |
| INLET MAN. PRESSURE | | (8) | in. HG (abs) | 94.4 | 71.5 | 48.9 |
| INLET MAN. TEMPERATURE | (MEASURED IN PLENUM) | (9) | °F | 142 | 138 | 135 |
| TIMING | | (10) | °BTDC | 27 | 27 | 27 |
| EXHAUST STACK TEMPERATURE | | (11) | °F | 898 | 943 | 984 |
| EXHAUST GAS FLOW (@ stack temp.) | | (12) | CFM | 12476 | 9780 | 6770 |
| EXHAUST MASS FLOW | | (12) | lb/hr | 22318 | 16940 | 11418 |

| EMISSIONS DATA | | | | | |
|---|---|---|---|---|---|
| NOx (as NO2) | (13) | g/bhp-hr | 0.5 | 0.5 | 0.5 |
| NTE CO | (14) | g/bhp-hr | 4.13 | 4.25 | 4.4 |
| NOMINAL CO | (15) | g/bhp-hr | 2.5 | 2.5 | 2.5 |
| THC (molecular weight of 15.84) | (14) | g/bhp-hr | 5.84 | 6.49 | 7.51 |
| NMHC (molecular weight of 15.84) | (14) | g/bhp-hr | 0.88 | 0.98 | 1.13 |
| EXHAUST O2 | (16) | % DRY | 9.0 | 8.8 | 8.6 |
| LAMBDA | (16) | | 1.71 | 1.67 | 1.57 |

| HEAT BALANCE DATA | | | | | |
|---|---|---|---|---|---|
| LHV INPUT | (17) | BTU/min | 242216 | 188451 | 134313 |
| HEAT REJECTION TO JACKET | (18) | BTU/min | 28738 | 23806 | 21929 |
| HEAT REJECTION TO ATMOSPHERE | (19) | BTU/min | 7210 | 6034 | 4857 |
| HEAT REJECTION TO LUBE OIL | (20) | BTU/min | 10108 | 9524 | 8917 |
| HEAT REJECTION TO EXHAUST (LHV to 77°F) | (21) | BTU/min | 76779 | 65253 | 45101 |
| HEAT REJECTION TO EXHAUST (LHV to 350°F) | (21) | BTU/min | 57574 | 47602 | 34587 |
| HEAT REJECTION TO A/C - STAGE 1 | (22) | BTU/min | 13823 | 5157 | 102 |
| HEAT REJECTION TO A/C - STAGE 2 | (23) | BTU/min | 8895 | 5684 | 4086 |

**CONDITIONS AND DEFINITIONS**

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1. DATA REPRESENTS CONDITIONS OF 77°F, 29.6 IN HG BAROMETRIC PRESSURE, 30% RELATIVE HUMIDITY, 10 IN H2O AIR FILTER RESTRICTION, AND 20 IN H2O EXHAUST STACK PRESSURE. ENGINE EFFICIENCY AND FUEL CONSUMPTION SPECIFICALLY NOTED AS ISO 3046/1 ARE REPRESENTED WITH 5 IN H2O AIR FILTER RESTRICTION AND 0 IN H2O EXHAUST STACK PRESSURE. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE. NO OVERLOAD PERMITTED AT RATING SHOWN.

EMISSION LEVELS ARE BASED ON THE ENGINE OPERATING AT STEADY STATE CONDITIONS AND ADJUSTED TO THE SPECIFIED NOx LEVEL AT 100% LOAD. EMISSION TOLERANCES SPECIFIED ARE DEPENDENT UPON FUEL QUALITY. METHANE NUMBER CANNOT VARY MORE THAN ± 3. PUBLISHED PART LOAD DATA IS WITH AIR FUEL RATIO CONTROL.

ENGINE RATING IS WITH 2 ENGINE DRIVEN WATER PUMPS. PUMP POWER IS NOT INCLUDED IN HEAT BALANCE DATA.

FOR NOTES INFORMATION CONSULT PAGE THREE.

## FUEL USAGE GUIDE

| CAT METHANE NUMBER | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IGNITION TIMING | - | - | - | - | - | - | - | - | 24 | 26 | 28 | 30 |
| DERATION FACTOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 1.00 |

## ALTITUDE DERATION FACTORS

| AIR TO TURBO (°F) | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | 0.96 | 0.93 | 0.89 | 0.86 | 0.83 | 0.79 | 0.76 | 0.74 | 0.71 | 0.68 | 0.65 | 0.63 | 0.60 |
| 120 | 0.98 | 0.94 | 0.91 | 0.87 | 0.84 | 0.81 | 0.78 | 0.75 | 0.72 | 0.69 | 0.66 | 0.64 | 0.61 |
| 110 | 0.99 | 0.96 | 0.92 | 0.89 | 0.86 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.68 | 0.65 | 0.62 |
| 100 | 1.00 | 0.97 | 0.94 | 0.90 | 0.87 | 0.84 | 0.81 | 0.77 | 0.74 | 0.72 | 0.69 | 0.66 | 0.63 |
| 90 | 1.00 | 0.99 | 0.96 | 0.92 | 0.89 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.67 | 0.65 |
| 80 | 1.00 | 1.00 | 0.97 | 0.94 | 0.90 | 0.87 | 0.84 | 0.80 | 0.77 | 0.74 | 0.71 | 0.68 | 0.66 |
| 70 | 1.00 | 1.00 | 0.99 | 0.96 | 0.92 | 0.89 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.67 |
| 60 | 1.00 | 1.00 | 1.00 | 0.97 | 0.94 | 0.90 | 0.87 | 0.83 | 0.80 | 0.77 | 0.74 | 0.71 | 0.68 |
| 50 | 1.00 | 1.00 | 1.00 | 0.99 | 0.96 | 0.92 | 0.88 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 |

ALTITUDE (FEET ABOVE SEA LEVEL)

## AFTERCOOLER HEAT REJECTION FACTORS

| AIR TO TURBO (°F) | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | 1.33 | 1.37 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 |
| 120 | 1.26 | 1.31 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 |
| 110 | 1.19 | 1.24 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 |
| 100 | 1.13 | 1.17 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |
| 90 | 1.06 | 1.11 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| 80 | 1.00 | 1.04 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 70 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 60 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

ALTITUDE (FEET ABOVE SEA LEVEL)

## FREE FIELD MECHANICAL & EXHAUST NOISE

| 100% Load Data | | | dB(A) | (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Free Field Mechanical | DISTANCE FROM THE ENGINE (FEET) | 3.2 | 108.5 | 51.5 | 78.7 | 88.2 | 92.9 | 99.9 | 97.3 | 93.2 | 99.2 |
| | | 22.9 | 91.6 | 34.6 | 59.0 | 68.1 | 74.0 | 83.0 | 79.4 | 75.1 | 85.2 |
| | | 49.2 | 85.0 | 28.0 | 55.2 | 64.7 | 69.4 | 76.4 | 73.8 | 69.7 | 75.7 |
| Free Field Exhaust | DISTANCE FROM THE ENGINE (FEET) | 4.9 | 106.1 | 67.5 | 86.5 | 96.0 | 88.5 | 88.7 | 90.1 | 95.6 | 92.7 |
| | | 22.9 | 92.7 | 54.1 | 73.1 | 82.6 | 75.1 | 75.3 | 76.7 | 82.2 | 79.3 |
| | | 49.2 | 86.1 | 47.5 | 66.5 | 76.0 | 68.5 | 68.7 | 70.1 | 75.6 | 72.7 |
| | | | Overal SPL | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 khz |

Octave Band Center Frequency (OBCF)

**FUEL USAGE GUIDE:**

This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

**ALTITUDE DERATION FACTORS:**

This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site.

**INLET AND EXHAUST RESTRICTION CORRECTIONS FOR ALTITUDE CAPABILITY:**

To determine the appropriate altitude derate factor to be applied to this engine for inlet or exhaust restrictions differering from the standard conditions listed on page 1, a correction to the site altitude can be made to adjust for this difference. Add 141 feet to the site altitude for each additional inch of H2O of exhaust stack pressure greater than spec sheet conditions. Add 282 feet to the site altitude for each additional inch of H2O of inlet restriction greater than spec sheet conditions. If site inlet restriction or exhaust stack pressure are less than spec sheet conditions, the same trends apply to lower the site altitude.

**ACTUAL ENGINE RATING:**

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration to the Altitude/Temperature deration whenever the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

**AFTERCOOLER HEAT REJECTION FACTORS:**

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail. For 2 Stage Aftercoolers with separate circuits, the 1st stage will collect 90% of the additional heat.

**SOUND DATA:**

Data determined by methods similar to ISO Standard DIS-8528-10. Accuracy Grade 3. SPL = Sound Pressure Level.

NOTES

1 ENGINE RATING IS WITH 2 ENGINE DRIVEN WATER PUMPS. TOLERANCE IS ± 3% OF FULL LOAD.

2 GENERATOR POWER DETERMINED WITH AN ASSUMED GENERATOR EFFICIENCY OF 96.1% AND POWER FACTOR OF 0.8 [GENERATOR POWER = ENGINE POWER x GENERATOR EFFICIENCY].

3 ISO 3046/1 ENGINE EFFICIENCY TOLERANCE IS (+)0, (-)5% OF FULL LOAD % EFFICIENCY VALUE. NOMINAL ENGINE EFFICIENCY TOLERANCE IS ± 2.5% OF FULL LOAD % EFFICIENCY VALUE.

4 THERMAL EFFICIENCY: JACKET HEAT + STAGE 1 A/C HEAT + EXH. HEAT TO 350°F.

5 TOTAL EFFICIENCY = ENGINE EFF. + THERMAL EFF. TOLERANCE IS ± 10% OF FULL LOAD DATA.

6 ISO 3046/1 FUEL CONSUMPTION TOLERANCE IS (+)5, (-)0% OF FULL LOAD DATA. NOMINAL FUEL CONSUMPTION TOLERANCE IS ± 2.5 % OF FULL LOAD DATA.

7 UNDRIED AIR. FLOW TOLERANCE IS ± 5 %

8 INLET MANIFOLD PRESSURE TOLERANCE IS ± 5 %

9 INLET MANIFOLD TEMPERATURE TOLERANCE IS ± 9°F.

10 TIMING INDICATED IS FOR USE WITH THE MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS.

11 EXHAUST STACK TEMPERATURE TOLERANCE IS (+)63°F, (-)54°F.

12 WET EXHAUST. FLOW TOLERANCE IS ± 6 %

13 NOX TOLERANCES ARE ± 18 % OF SPECIFIED VALUE.

14 NTE CO, CO2, THC, and NMHC VALUES ARE "NOT TO EXCEED".

15 NOMINAL CO IS A NOMINAL VALUE AND IS REPRESENTATIVE OF A NEW ENGINE DURING THE FIRST 100 HOURS OF ENGINE OPERATION.

16 O2% TOLERANCE IS ± 0.5; LAMBDA TOLERANCE IS ± 0.05. LAMBDA AND O2 LEVEL ARE THE RESULT OF ADJUSTING THE ENGINE TO OPERATE AT THE SPECIFIED NOX LEVEL.

17 LHV RATE TOLERANCE IS ± 2.5%.

18 TOTAL JW HEAT (based on treated water) = JACKET HEAT + STAGE 1 A/C HEAT + 0.90 x (STAGE 1 + STAGE 2) x (ACHRF-1). TOLERANCE IS ± 10 % OF FULL LOAD DATA.

19 RADIATION HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 50% OF FULL LOAD DATA.

20 LUBE OIL HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 20% OF FULL LOAD DATA.

21 EXHAUST HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 10% OF FULL LOAD DATA.

22 STAGE 1 A/C HEAT (based on treated water) = STAGE 1 A/C HEAT + 0.90 x (STAGE 1 + STAGE 2) x (ACHRF-1). TOLERANCE IS ± 5 % OF FULL LOAD DATA.

23 STAGE 2 A/C HEAT (based on treated water) = (STAGE 2 A/C HEAT + (STAGE 1 + STAGE 2) x 0.10 x (ACHRF - 1)) + LUBE OIL HEAT. TOLERANCE IS ± 5 % OF FULL LOAD DATA.

*Appendix D*

*Example Subparts JJJJ & ZZZZ Permit Conditions*

## *Example Subpart JJJJ and Subpart ZZZZ Permit Conditions*

Initial Compliance Tests. . Each emissions unit shall be tested to demonstrate initial compliance with the emissions standards for CO, $NO_X$, VOC, VE. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the units. The initial performance tests demonstrating compliance for CO, $NO_X$ and VOC, as required by 40 CFR 60 Subpart JJJJ will satisfy this condition for those pollutants. [40 CFR 60 Subpart JJJJ]

Performance Tests. For each emissions unit, the permittee must conduct an initial performance test within 60 days after achieving permitted capacity, but not later than 180 days after initial startup of the units. Subsequent performance testing shall be conducted every 8,760 hours or 3 years, whichever comes first to demonstrate compliance with emission standards of this permit and requirements of 40 CFR 60 Subpart JJJJ. Performance tests shall be conducted in accordance with the requirements of 40 CFR 60, Subpart JJJJ. Performance tests must be conducted within 10 percent of 100 percent peak (or highest achievable) load and according to the requirements in 40 CFR 60.8 and under the specific conditions that are specified in 40 CFR 60 Subpart JJJJ, Table 2. [40 CFR 60.4244 and 60.4243(b)(2)~~i~~iii)]

Test Requirements. The permittee shall notify the Compliance Authority in writing at least 30 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. [40 CFR 60.8]

Federal Rule Requirements. In addition to the specific conditions listed above, these emissions units are also subject to the applicable requirements contained in 40 CFR 60, Subpart A – General Provisions , 40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, and 40 CFR 63, Subpart A – General Provisions and 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines attached to this permit as Appendix NSPS A, and Appendix NSPS JJJJ, Appendix NESHAP A, and Appendix NESHAP ZZZZ, respectively. [Rule 62-213.440, F.A.C.]

Alternative Method of Operation.

a. *Authorized Engine Replacements*. At the time that any of the emissions units (EU006 through EU013)need to be replaced, the owner or operator may permanently replace the emissions unit with an engine that shall be the identical make, model, and maximum heat input. All replacement engines

shall be owned by Waste Management. All replacement engines shall meet the applicable requirements of 40 CFR 60 Subpart JJJJ and/or 40 CFR 63 Subpart ZZZZ and the conditions of this permit.

b. *Notifications*.

i. At least 15 days prior to installation of the replacement engine the owner or operator shall provide written notification to the Department's South District office. The notification shall contain the following information:

1. Emission unit number that is being replaced.

2. Replacement engine's information including make, model, year of manufacturer, serial number,
3. maximum engine power, maximum heat input, maximum gas flow, and engine displacement.

4. Date of commencement of installation.

5. Documentation that the engine does or does not meet the definition of "*reconstruction*." *Reconstruction* is defined as the replacement of components of an affected or a previously nonaffected source to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source.

6. Applicable requirements and regulations.

7. The notification shall be signed by the facility's responsible official.

ii. The owner or operator shall provide written notification to the Department's South District office within seven days after placing the replacement engine into operation.

Install five (5) new non-certified, landfill gas-fired, stationary spark ignition (SI) reciprocating internal combustion engines (RICE) (SN-04 through SN-08) to power electric generators, to be known as Landfill-Gas-To-Energy (LFGTE) Facility. The

engines shall be subject to and comply with 40 CFR 60, Subpart JJJJ and 40 CFR 63, Subpart ZZZZ, as an area source of HAPs, SC #15 through #23;

Landfill-gas-To-Energy (LFGTE) Facility – Five Engines (SN-04 through SN-08) – A new LFGTE Facility will have five (5) new landfill (LF) gas-fired, stationary internal combustion engines (ICE) (SN-04 through SN-08) to power electric generators. The LFGTE Facility consists of five Caterpillar Model G3516 stationary ICE, and electric generator and auxiliary systems. The engines are four-stroke lean-burn (4SLB), turbocharged, after cooled units, each rated 1,148 b-hp. GCCS will convey the LFG to both the flares and the LFGTE Facility. At the LFGTE Facility, the LFG will be passed through a treatment system that removes some moisture includes a filter to remove particulates (greater than $PM_{10}$) entrained in the gas stream. The gas will then be compressed and used as fuel in the engines to drive the electric generator. The RICEs shall be subject to 40 CFR 60, Subpart JJJJ - *Stationary Spark Ignition Internal Combustion Engines* and 40 CFR 63, Subpart ZZZZ - *Stationary Reciprocating Internal Combustion Engines,* as an area source of HAPs, which states that the engines have to be operated in compliance with NSPS JJJJ.

SN-04 through SN-08 are new 4SLB, stationary reciprocating internal combustion (RICE) engines located at landfill, an area source of HAP emissions. The engines combust landfill or digester gas equivalent to 10% or more of the gross heat input on an annual basis. These engines are subject to and shall comply with the provisions of 40 CFR Part 63, Subpart ZZZZ - *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines* (RICE) (Appendix C) by meeting the requirements of 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for SN-04 through SN-08 under 40 CFR Part 63, Subpart ZZZZ. [40 CFR Part §63.6580, Subpart ZZZZ, §63.6590(c)]

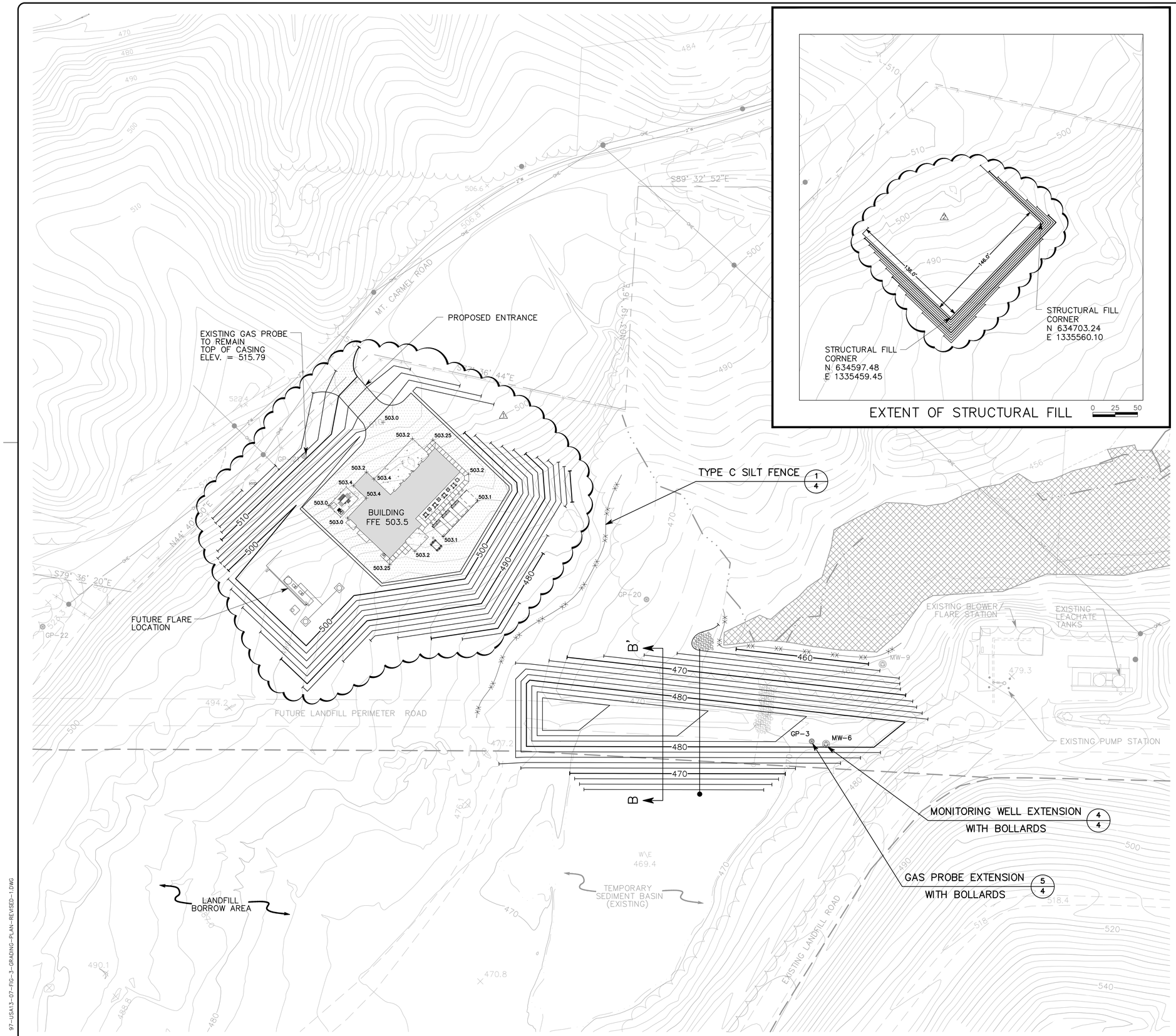
a. Each performance test must be conducted within 10 % of 100 % peak (or the highest achievable) load and must comply with the testing requirements listed in 40 CFR §60.8 and under the specific conditions that are specified by Table 2 of Subpart JJJJ of Part 60 - Requirements for Performance Tests;
b. Performance tests may not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 CFR §60.8(c). If the engine is non-operational when a performance test is due, the engine does not need to be started up just to test it, but will need to be tested immediately upon startup;
c. Three separate test runs must be conducted for each engine performance test as specified by §60.8(f). Each test run must be conducted within 10 % of 100 % peak (or the highest achievable) load and be at least 1 hour in duration;

The permittee must submit to the Department a copy of the initial and subsequent performance tests within 60 days of the completion of the tests and maintain a copy on-site and make available to Department personnel upon request. [40 CFR 60.4245(d)]

20. Within 60 days of completion of construction of the LFGTE facility, the permittee must meet the following notification, reporting and recordkeeping requirements for all engines (SN-04 through SN-08) subject to 40 CFR Part 60 Subpart JJJJ. In addition, the permittee shall submit to the Department, maintain on-site and make available to Department personnel upon request, a comprehensive report showing compliance of each engine with NSPS Subpart JJJJ within 60 days of the completion of the tests The report shall be submitted to the Department at the address listed in General Provision #7. The notification must include the following information:

    a. All notifications submitted to comply with 40 CFR Part 60 Subpart JJJJ and all documentation supporting any notification;
    b. Maintenance conducted on each engine;
    c. Documentation that each engine meets the emission standard, as listed in Specific Condition #17;
    d. Name and address of the permittee;
    e. The address of each affected source;
    f. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
    g. Emission control equipment; and
    h. Fuel used..

    [40 CFR 60.4245(a)(1,2,4), (c)(1-5) and (d)]




50 25 0 50
SCALE FEET

## LEGEND

- PROPERTY BOUNDARY
- PERMITTED LANDFILL
- EXISTING FENCE
- TREE LINE
- 420 EXISTING CONTOUR
- 520 PROPOSED CONTOUR
- EXISTING ROAD
- FUTURE LANDFILL ROAD
- EXISTING LANDFILL ROAD
- EXISTING CULVERT
- PROPOSED SILT FENCE
- SEDIMENT BASIN DISCHARGE STRUCTURE
- EXISTING WETLANDS
- JURISDICTIONAL STREAM
- EXISTING OVERHEAD UTILITIES (ELECTRIC)
- POWER POLE
- EXISTING GAS PROBE
- EXISTING MONITORING WELL
- EXISTING WATER HYDRANT
- EXISTING RIP-RAP SPILLWAY
- PROPOSED RIP-RAP
- 503.25 SPOT ELEVATION

## NOTES

1. TOPOGRAPHIC SURVEY PROVIDED BY SOUTHERN RESOURCES MAPPING CORPORATION, DATED JANUARY 15, 2008 AND REVISED 02-25-10.
2. TOPOGRAPHY IN PROJECT AREA UPDATED FROM TRI-STATE SURVEYING, LLC., FIELD SURVEY DATED 12-22-10.
3. PROPERTY BOUNDARY OBTAINED FROM TRI-STATE SURVEYING, LLC., DATED 12-22-10.
4. COMPACTED STRUCTURAL FILL PAD LIMITS ARE BASED ON A MINIMUM 5 FOOT HORIZONTAL DISTANCE FROM THE OUTERMOST EDGE OF BUILDING AND ALL PIERS, SIDEWALKS, OR CONCRETE PADS. COMPACTED FILL SOIL IS REQUIRED TO BRING FINAL GRADE TO 3H:IV FINAL SLOPE.

TriAD ENVIRONMENTAL CONSULTANTS, INC.
Suite 200, 207 Donelson Pike, Nashville, TN 37214
615-889-6858, fax: 615-889-4004

WASTE MANAGEMENT, INC.

| NO. | REVISION | BY | DATE |
|---|---|---|---|
| 1 | REVISED GRADES AT PAD | NBS | 6/1/11 |
| 2 | REVISED STRUCTURAL FILL GRADES | NBS | 6/1/11 |

# GRADING PLAN

WEST CAMDEN LFGTE EARTHWORK CONSTRUCTION PLANS

DWN BY: DWF
CHK BY: NBS

DATE: 06/01/11
SCALE: 1"=50'

WASTE MANAGEMENT

DRAWING NO.
97-USA13-07-FIG-3-GRADING-PLAN-REVISED-1.DWG

SHEET
3

97-USA13-07-FIG-3-GRADING-PLAN-REVISED-1.DWG

# G3520C

## GAS ENGINE TECHNICAL DATA

CATERPILLAR®

| | | | |
|---|---|---|---|
| ENGINE SPEED: | 1200 | FUEL: | LOW ENERGY (1.43 CH4:CO2 RATIO) |
| COMPRESSION RATIO: | 11.3:1 | FUEL SYSTEM: | CAT LOW PRESSURE WITH AIR FUEL RATIO CONTROL |
| AFTERCOOLER - STAGE 1 MAX. INLET (°F): | 218 | | |
| AFTERCOOLER - STAGE 2 MAX. INLET (°F): | 130 | FUEL PRESS. RANGE (PSIG): | 1.5 - 5.0 |
| JACKET WATER - MAX. OUTLET (°F): | 230 | MIN. METHANE NUMBER: | 135 |
| COOLING SYSTEM: | JW+1AC, OC+2AC | RATED ALTITUDE (FT): | 1378 |
| IGNITION SYSTEM: | ADEM3 | AT AIR TO TURBO. TEMP. (°F): | 77 |
| SPARK PLUG TYPE: | J-GAP | NOx EMISSION LEVEL: | 0.5 g/bhp-hr |
| EXHAUST MANIFOLD: | DRY | FUEL LHV (BTU/SCF): | 456 |
| COMBUSTION: | LOW EMISSION | APPLICATION: | GENSET |

| RATING AND EFFICIENCY | | NOTES | LOAD | 100% | 75% | 50% |
|---|---|---|---|---|---|---|
| ENGINE POWER | (WITHOUT FAN) | (1) | BHP | 2233 | 1675 | 1116 |
| GENERATOR POWER | (WITHOUT FAN) | (2) | EKW | 1600 | 1200 | 800 |
| **ENGINE EFFICIENCY** | **(ISO 3046/1)** | **(3)** | **%** | **40.1** | **38.6** | **36.1** |
| ENGINE EFFICIENCY | (NOMINAL) | (3) | % | 39.1 | 37.7 | 35.2 |
| THERMAL EFFICIENCY | (NOMINAL) | (4) | % | 40.1 | 39.3 | 40.8 |
| TOTAL EFFICIENCY | (NOMINAL) | (5) | % | 79.2 | 77.0 | 76.0 |

| ENGINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| **FUEL CONSUMPTION** | **(ISO 3046/1)** | **(6)** | **BTU/bhp-hr** | **6354** | **6592** | **7047** |
| FUEL CONSUMPTION | (NOMINAL) | (6) | BTU/bhp-hr | 6509 | 6753 | 7219 |
| AIR FLOW (77 °F, 14.7 psi) | | (7) | SCFM | 4512 | 3415 | 2286 |
| AIR FLOW | | (7) | lb/hr | 20006 | 15141 | 10136 |
| COMPRESSOR OUT PRESSURE | | | in. HG (abs) | 105.8 | 80.8 | 55.5 |
| COMPRESSOR OUT TEMPERATURE | | | °F | 375 | 306 | 220 |
| AFTERCOOLER AIR OUT TEMPERATURE | | | °F | 142 | 138 | 135 |
| INLET MAN. PRESSURE | | (8) | in. HG (abs) | 94.4 | 71.5 | 48.9 |
| INLET MAN. TEMPERATURE | (MEASURED IN PLENUM) | (9) | °F | 142 | 138 | 135 |
| TIMING | | (10) | °BTDC | 27 | 27 | 27 |
| EXHAUST STACK TEMPERATURE | | (11) | °F | 898 | 943 | 984 |
| EXHAUST GAS FLOW (@ stack temp.) | | (12) | CFM | 12476 | 9780 | 6770 |
| EXHAUST MASS FLOW | | (12) | lb/hr | 22318 | 16940 | 11418 |

| EMISSIONS DATA | | | | | |
|---|---|---|---|---|---|
| NOx (as NO2) | (13) | g/bhp-hr | 0.5 | 0.5 | 0.5 |
| NTE CO | (14) | g/bhp-hr | 4.13 | 4.25 | 4.4 |
| NOMINAL CO | (15) | g/bhp-hr | 2.5 | 2.5 | 2.5 |
| THC (molecular weight of 15.84) | (14) | g/bhp-hr | 5.84 | 6.49 | 7.51 |
| NMHC (molecular weight of 15.84) | (14) | g/bhp-hr | 0.88 | 0.98 | 1.13 |
| EXHAUST O2 | (16) | % DRY | 9.0 | 8.8 | 8.6 |
| LAMBDA | (16) | | 1.71 | 1.67 | 1.57 |

| HEAT BALANCE DATA | | | | | |
|---|---|---|---|---|---|
| LHV INPUT | (17) | BTU/min | 242216 | 188451 | 134313 |
| HEAT REJECTION TO JACKET | (18) | BTU/min | 28738 | 23806 | 21929 |
| HEAT REJECTION TO ATMOSPHERE | (19) | BTU/min | 7210 | 6034 | 4857 |
| HEAT REJECTION TO LUBE OIL | (20) | BTU/min | 10108 | 9524 | 8917 |
| HEAT REJECTION TO EXHAUST (LHV to 77°F) | (21) | BTU/min | 76779 | 65253 | 45101 |
| HEAT REJECTION TO EXHAUST (LHV to 350°F) | (21) | BTU/min | 54657 | 45140 | 32710 |
| HEAT REJECTION TO A/C - STAGE 1 | (22) | BTU/min | 13823 | 5157 | 102 |
| HEAT REJECTION TO A/C - STAGE 2 | (23) | BTU/min | 8895 | 5684 | 4086 |

**CONDITIONS AND DEFINITIONS**

ENGINE RATING OBTAINED AND PRESENTED IN ACCORDANCE WITH ISO 3046/1. DATA REPRESENTS CONDITIONS OF 77°F, 29.6 IN HG BAROMETRIC PRESSURE, 30% RELATIVE HUMIDITY, 10 IN H2O AIR FILTER RESTRICTION, AND 20 IN H2O EXHAUST STACK PRESSURE. ENGINE EFFICIENCY AND FUEL CONSUMPTION SPECIFICALLY NOTED AS ISO 3046/1 ARE REPRESENTED WITH 5 IN H2O AIR FILTER RESTRICTION AND 0 IN H2O EXHAUST STACK PRESSURE. CONSULT ALTITUDE CURVES FOR APPLICATIONS ABOVE MAXIMUM RATED ALTITUDE AND/OR TEMPERATURE. NO OVERLOAD PERMITTED AT RATING SHOWN.

EMISSION LEVELS ARE BASED ON THE ENGINE OPERATING AT STEADY STATE CONDITIONS AND ADJUSTED TO THE SPECIFIED NOx LEVEL AT 100% LOAD. EMISSION TOLERANCES SPECIFIED ARE DEPENDENT UPON FUEL QUALITY. METHANE NUMBER CANNOT VARY MORE THAN ± 3. PUBLISHED PART LOAD DATA IS WITH AIR FUEL RATIO CONTROL.

ENGINE RATING IS WITH 2 ENGINE DRIVEN WATER PUMPS. PUMP POWER IS NOT INCLUDED IN HEAT BALANCE DATA.

FOR NOTES INFORMATION CONSULT PAGE THREE.

## FUEL USAGE GUIDE

| CAT METHANE NUMBER | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IGNITION TIMING | - | - | - | - | - | - | - | - | 24 | 26 | 28 | 30 |
| DERATION FACTOR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 1.00 |

## ALTITUDE DERATION FACTORS

| AIR TO TURBO (°F) | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | 0.96 | 0.93 | 0.89 | 0.86 | 0.83 | 0.79 | 0.76 | 0.74 | 0.71 | 0.68 | 0.65 | 0.63 | 0.60 |
| 120 | 0.98 | 0.94 | 0.91 | 0.87 | 0.84 | 0.81 | 0.78 | 0.75 | 0.72 | 0.69 | 0.66 | 0.64 | 0.61 |
| 110 | 0.99 | 0.96 | 0.92 | 0.89 | 0.86 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.68 | 0.65 | 0.62 |
| 100 | 1.00 | 0.97 | 0.94 | 0.90 | 0.87 | 0.84 | 0.81 | 0.77 | 0.74 | 0.72 | 0.69 | 0.66 | 0.63 |
| 90 | 1.00 | 0.99 | 0.96 | 0.92 | 0.89 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.67 | 0.65 |
| 80 | 1.00 | 1.00 | 0.97 | 0.94 | 0.90 | 0.87 | 0.84 | 0.80 | 0.77 | 0.74 | 0.71 | 0.68 | 0.66 |
| 70 | 1.00 | 1.00 | 0.99 | 0.96 | 0.92 | 0.89 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 | 0.67 |
| 60 | 1.00 | 1.00 | 1.00 | 0.97 | 0.94 | 0.90 | 0.87 | 0.83 | 0.80 | 0.77 | 0.74 | 0.71 | 0.68 |
| 50 | 1.00 | 1.00 | 1.00 | 0.99 | 0.96 | 0.92 | 0.88 | 0.85 | 0.82 | 0.79 | 0.76 | 0.73 | 0.70 |

ALTITUDE (FEET ABOVE SEA LEVEL)

## AFTERCOOLER HEAT REJECTION FACTORS

| AIR TO TURBO (°F) | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | 1.33 | 1.37 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 |
| 120 | 1.26 | 1.31 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 | 1.33 |
| 110 | 1.19 | 1.24 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 | 1.26 |
| 100 | 1.13 | 1.17 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |
| 90 | 1.06 | 1.11 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| 80 | 1.00 | 1.04 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 |
| 70 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 60 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

ALTITUDE (FEET ABOVE SEA LEVEL)

**FUEL USAGE GUIDE:**

This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

**ALTITUDE DERATION FACTORS:**

This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site.

**INLET AND EXHAUST RESTRICTION CORRECTIONS FOR ALTITUDE CAPABILITY:**

To determine the appropriate altitude derate factor to be applied to this engine for inlet or exhaust restrictions differering from the standard conditions listed on page 1, a correction to the site altitude can be made to adjust for this difference. Add 141 feet to the site altitude for each additional inch of H2O of exhaust stack pressure greater than spec sheet conditions. Add 282 feet to the site altitude for each additional inch of H2O of inlet restriction greater than spec sheet conditions. If site inlet restriction or exhaust stack pressure are less than spec sheet conditions, the same trends apply to lower the site altitude.

**ACTUAL ENGINE RATING:**

It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration to the Altitude/Temperature deration whenever the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

**AFTERCOOLER HEAT REJECTION FACTORS:**

Aftercooler heat rejection is given for standard conditions of 77°F and 500 ft altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail. For 2 Stage Aftercoolers with separate circuits, the 1st stage will collect 90% of the additional heat.

**SOUND DATA:**

Sound Power Data can be found in DM8888.

**NOTES**

1 ENGINE RATING IS WITH 2 ENGINE DRIVEN WATER PUMPS. TOLERANCE IS ± 3% OF FULL LOAD.

2 GENERATOR POWER DETERMINED WITH AN ASSUMED GENERATOR EFFICIENCY OF 96.1% AND POWER FACTOR OF 0.8 [GENERATOR POWER = ENGINE POWER x GENERATOR EFFICIENCY].

3 ISO 3046/1 ENGINE EFFICIENCY TOLERANCE IS (+)0, (-)5% OF FULL LOAD % EFFICIENCY VALUE. NOMINAL ENGINE EFFICIENCY TOLERANCE IS ± 2.5% OF FULL LOAD % EFFICIENCY VALUE.

4 THERMAL EFFICIENCY: JACKET HEAT + STAGE 1 A/C HEAT + EXH. HEAT TO 350°F.

5 TOTAL EFFICIENCY = ENGINE EFF. + THERMAL EFF. TOLERANCE IS ± 10% OF FULL LOAD DATA.

6 ISO 3046/1 FUEL CONSUMPTION TOLERANCE IS (+)5, (-)0% OF FULL LOAD DATA. NOMINAL FUEL CONSUMPTION TOLERANCE IS ± 2.5 % OF FULL LOAD DATA.

7 UNDRIED AIR. FLOW TOLERANCE IS ± 5 %

8 INLET MANIFOLD PRESSURE TOLERANCE IS ± 5 %

9 INLET MANIFOLD TEMPERATURE TOLERANCE IS ± 9°F.

10 TIMING INDICATED IS FOR USE WITH THE MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS.

11 EXHAUST STACK TEMPERATURE TOLERANCE IS (+)63°F, (-)54°F.

12 WET EXHAUST. FLOW TOLERANCE IS ± 6 %

13 NOX TOLERANCES ARE ± 18 % OF SPECIFIED VALUE.

14 NTE CO, CO2, THC, and NMHC VALUES ARE "NOT TO EXCEED".

15 NOMINAL CO IS A NOMINAL VALUE AND IS REPRESENTATIVE OF A NEW ENGINE DURING THE FIRST 100 HOURS OF ENGINE OPERATION.

16 O2% TOLERANCE IS ± 0.5; LAMBDA TOLERANCE IS ± 0.05. LAMBDA AND O2 LEVEL ARE THE RESULT OF ADJUSTING THE ENGINE TO OPERATE AT THE SPECIFIED NOX LEVEL.

17 LHV RATE TOLERANCE IS ± 2.5%.

18 TOTAL JW HEAT (based on treated water) = JACKET HEAT + STAGE 1 A/C HEAT + 0.90 x (STAGE 1 + STAGE 2) x (ACHRF-1). TOLERANCE IS ± 10 % OF FULL LOAD DATA.

19 RADIATION HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 50% OF FULL LOAD DATA.

20 LUBE OIL HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 20% OF FULL LOAD DATA.

21 EXHAUST HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 10% OF FULL LOAD DATA.

22 STAGE 1 A/C HEAT (based on treated water) = STAGE 1 A/C HEAT + 0.90 x (STAGE 1 + STAGE 2) x (ACHRF-1). TOLERANCE IS ± 5 % OF FULL LOAD DATA.

23 STAGE 2 A/C HEAT (based on treated water) = (STAGE 2 A/C HEAT + (STAGE 1 + STAGE 2) x 0.10 x (ACHRF - 1)) + LUBE OIL HEAT. TOLERANCE IS ± 5 % OF FULL LOAD DATA.

**TENNESSEE AIR POLLUTION CONTROL BOARD**
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**
**NASHVILLE, TENNESSEE 37243-1531**

**DRAFT**

# OPERATING PERMIT (TITLE V) Issued Pursuant to Tennessee Air Quality Act

This permit fulfills the requirements of Title V of the Federal Clean Air Act (42 U.S.C. 7661a-7661e) and the federal regulations promulgated thereunder at 40 CFR Part 70. (FR Vol. 57, No. 140, Tuesday, July 21, 1992 p.32295-32312). This permit is issued in accordance with the provisions of paragraph 1200-3-9-.02(11) of the Tennessee Air Pollution Control Regulations. The permittee has been granted permission to operate an air contaminant source in accordance with emissions limitations and monitoring requirements set forth herein.

Date Issued: 45 days from pub notice of Dec 24 (est Feb 8, 2010)

Permit Number: **556483**

Date Expires:

Issued To:
**West Camden Sanitary Landfill/Waste Management**

Installation Address:
**2410 Highway 70 West**
**Camden**

Installation Description:
**Municipal Solid Waste Landfill**
**NSPS , 40 CFR 60, Subpart WWW**
**with Gas Collection and Control System**

Emission Source Reference No.: **03-0045**

Renewal Application Due Date: Between XX, and XX.

Primary SIC: 4953

Responsible Official:
Name: Timothy M. Wells
Title: Landfill Responsible Official

Facility Contact Person:
Name: Jackie Moore, Waste Management
Title: District Manager
Phone: 731-584-7734

Information Relied Upon:
**Application dated May 30, 2003**

TECHNICAL SECRETARY

No Authority is Granted by this Permit to Operate, Construct, or Maintain any Installation in Violation of any Law, Statute, Code, Ordinance, Rule, or Regulation of the State of Tennessee or any of its Political Subdivisions.

**POST AT INSTALLATION ADDRESS**

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# SECTION A

# GENERAL PERMIT CONDITIONS

**A permit issued under the provisions of paragraph 1200-3-9-.02(11) is a permit issued pursuant to the requirements of Title V of the Federal Act and its implementing Federal regulations promulgated at 40 CFR, Part 70.**

**A1.** **Definitions.** Terms not otherwise defined in the permit shall have the meaning assigned to such terms in the referenced regulation.

TAPCR 1200-3

**A2**. **Compliance requirement.** All terms and conditions in a permit issued pursuant to paragraph 1200-3-9-.02(11) including any provisions designed to limit a source's potential to emit, are enforceable by the Administrator and citizens under the Federal Act.

The permittee shall comply with all conditions of its permit. Except for requirements specifically designated herein as not being federally enforceable (State Only), non-compliance with the permit requirements is a violation of the Federal Act and the Tennessee Air Quality Act and is grounds for enforcement action; for a permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Non-compliance with permit conditions specifically designated herein as not being federally enforceable (State Only) is a violation of the Tennessee Air Quality Act and may be grounds for these actions.

TAPCR 1200-3-9-.02(11)(e)2(i) and 1200-3-9-.02(11)(e)1(vi)(I)

**A3.** **Need to halt or reduce activity.** The need to halt or reduce activity is not a defense for noncompliance. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit. However, nothing in this item shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in assessing penalties for noncompliance if the health, safety or environmental impacts of halting or reducing operations would be more serious than the impacts of continuing operations.

TAPCR 1200-3-9-.02(11)(e)1(vi)(II)

**A4.** **The permit.** The permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

TAPCR 1200-3-9-.02(11)(e)1(vi)(III)

**A5.** **Property rights.** The permit does not convey any property rights of any sort, or any exclusive privilege.

TAPCR 1200-3-9-.02(11)(e)1(vi)(IV)

**A6.** **Submittal of requested information.** The permittee shall furnish to the Technical Secretary, within a reasonable time, any information that the Technical Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or termination of the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Technical Secretary copies of records required to be kept by the permit. If the permittee claims that such information is confidential, the Technical Secretary may review that claim and hold the information in protected status until such time that the Board can hear any contested proceedings regarding confidentiality disputes. If the information is desired by EPA, the permittee may mail the information directly to EPA. Any claims of confidentiality for federal purposes will be determined by EPA.

TAPCR 1200-3-9-.02(11)(e)1(vi)(V)

**A7.** **Severability clause.** The requirements of this permit are severable. A dispute regarding one or more requirements of this permit does not invalidate or otherwise excuse the permittee from their duty to comply with the remaining portion of the permit.

TAPCR 1200-3-9.02(11)(e)1(v)

**A8.** **Fee payment.**

**(a)** The permittee shall pay an annual major source emission fee based upon the responsible official's choice of actual emissions or allowable emissions. An emission cap of 4,000 tons per year per regulated pollutant per major source SIC Code shall apply to actual or allowable based emission fees. A major source annual emission fee will not be charged for emissions in excess of the cap (s) or for carbon monoxide.

**(b)** Major sources who have filed a timely, complete operating permit application in accordance with 1200-3-9-.02(11), shall pay allowable emission based fees until the beginning of the next annual accounting period following receipt of their major source operating permit. At that time, the permittee shall begin paying their annual emission fee based upon their choice of actual or allowable based fees, or mixed actual and allowable based fees as stated under SECTION E of this permit. Once permitted, altering the existing choice shall be accomplished by a written request of the major source, filed in the office of the Technical Secretary at least one hundred eighty days prior to the expiration or reissuance of the major source operating permit.

**(c)** Major sources must conform to the following requirements with respect to fee payments:

**1.** If a major source choosing an allowable based annual emission fee wishes to restructure its allowable emissions for the purposes of lowering its annual emission fees, a mutually agreed upon, more restrictive regulatory requirement may be established to minimize the allowable emissions and thus the annual emission fee. The more restrictive requirement must be specified on the permit, and must include the method used to determine compliance with the limitation. The documentation procedure to be followed by the major source must also be included to insure that the limit is not exceeded. Restructuring the allowable emissions is permissible only in the annual accounting periods of eligibility and only, if the written request for restructuring is filed with the Technical Secretary at least 120 days prior to the beginning of the annual accounting period of eligibility. These periods of eligibility occur upon expiration of the initial major source operating permit, renewal of an expired major source operating permit or reissuance of a major source operating permit.

**2.** Beginning with the annual accounting period beginning July 1, 1997 to June 30, 1998, major sources paying on allowable based emission fees will be billed by the Division no later than April 1 prior to the end of the accounting period. The major source annual emission fee is due July 1 following the end of the accounting period.

**3.** Beginning with the annual accounting period beginning July 1, 1997 to June 30, 1998, major sources choosing an actual based annual emission fee shall file an actual emissions analysis with the Technical Secretary which summarizes the actual emissions of all regulated pollutants at the air contaminant sources of their facility. Based upon the actual emissions analysis, the source shall calculate the fee due and submit the payment and the analysis each July 1st following the end of the annual accounting period.

**4.** Beginning with the annual accounting period beginning July 1,1997 to June 30, 1998, major sources choosing a mixture of allowable and actual based emission fees shall file an actual emissions and allowable emissions analysis with the Technical Secretary which summarizes the actual and allowable emissions of all regulated pollutants at the air contaminant sources of their facility. Based upon the analysis, the source shall calculate the fee due and submit the payment and the analysis each July 1st following the end of the annual accounting period.

The mixed based fee shall be calculated utilizing the 4,000 ton cap specified in subparagraph 1200-3-26-.02(2)(i). In determining the tonnages to be applied toward the regulated pollutant 4,000 ton cap in a mixed based fee, the source shall first calculate the actual emission based fees for a regulated pollutant and apply that tonnage toward the regulated pollutant's cap. The remaining tonnage available in the 4,000 ton category of a regulated pollutant shall be subject to allowable emission based fee calculations for the sources that were not included in the actual emission based fee calculations. Once the 4,000 ton cap has been reached for a regulated pollutant, no additional fee shall be required.

**5.** Major sources choosing to pay their major source annual emission fee based on actual based emissions or a mixture of allowable and actual based emissions may request an extension of time to file their emissions analysis with the Technical Secretary. The extension may be granted by the Technical Secretary up to ninety (90) days. The request for extension must be postmarked no later than July 1 or the request for extension shall be denied. The request for extension to file must state the reason and give an adequate explanation.

An estimated annual emission fee payment of no less than eighty percent (80%) of the fee due July 1 must accompany the request for extension to avoid penalties and interest on the underpayment of the annual emission fee. A remaining balance due must accompany the emission analysis. If there has been an overpayment, a refund may be requested in writing to the Division or be applied as a credit toward next year's major source annual emission fee. The request for

extension of time is not available to major sources choosing to pay their major source annual emission fee based on allowable emissions.

**6.** Newly constructed major sources or minor existing sources modifying their operations such that they become a major source in the midst of the standard July 1st to June 30th annual accounting period, shall pay allowable based annual emission fees for the fractional remainder of the annual accounting period commencing upon their start-up. At the beginning of the next annual accounting period, the "responsible official" of the source may choose to pay annual emission fees based on actual or allowable emissions or a mixture of the two as provided for in this rule 1200-3-26-.02.

**(d)** Where more than one (1) allowable emission limit is applicable to a regulated pollutant, the allowable emissions for the regulated pollutants shall not be double counted. Major sources subject to the provisions of paragraph 1200-3-26-.02(9) shall apportion their emissions as follows to ensure that their fees are not double counted.

**1.** Sources that are subject to federally promulgated hazardous air pollutant standards that can be imposed under Chapter 1200-3-11 or Chapter 1200-3-31 will place such regulated emissions in the specific hazardous air pollutant under regulation. If the pollutant is also in the family of volatile organic compounds or the family of particulates, the pollutant shall not be placed in that respective family category.

**2.** A miscellaneous category of hazardous air pollutants shall be used for hazardous air pollutants listed at part 1200-3-26-.02(2)(i)12 that do not have an allowable emission standard. A pollutant placed in this category shall not be subject to being placed in any other category such as volatile organic compounds or particulates.

**3.** Each individual hazardous air pollutant and the miscellaneous category of hazardous air pollutants is subject to the 4,000 ton cap provisions of subparagraph 1200-3-26-.02(2)(i).

**4.** Major sources that wish to pay annual emission fees for $PM_{10}$ on an allowable emission basis may do so if they have a specific $PM_{10}$ allowable emission standard. If a major source has a total particulate emission standard, but wishes to pay annual emission fees on an actual $PM_{10}$ emission basis, it may do so if the $PM_{10}$ actual emission levels are proven to the satisfaction of the Technical Secretary. The method to demonstrate the actual $PM_{10}$ emission levels must be made as part of the source's major source operating permit in advance in order to exercise this option. The $PM_{10}$ emissions reported under these options shall not be subject to fees under the family of particulate emissions. The 4,000 ton cap provisions of subparagraph 1200-3-26-.02(2)(i) shall also apply to $PM_{10}$ emissions.

TAPCR 1200-3-26-.02 (3) and (9) and 1200-3-9-.02(11)(e)1(vii)

**A9.** **Permit revision not required.** A permit revision will not be required under any approved economic incentives, marketable permits, emissions trading and other similar programs or process for changes that are provided for in the permit.

TAPCR 1200-3-9-.02(11)(e)1(viii)

**A10.** **Inspection and entry.** Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Technical Secretary or his authorized representative to perform the following for the purposes of determining compliance with the permit applicable requirements:

**(a)** Enter upon, at reasonable times, the permittee's premises where a source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit;

**(b)** Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

**(c)** Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and

**(d)** As authorized by the Clean Air Act and Chapter 1200-3-10 of TAPCR, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

**(e)** "Reasonable times" shall be considered to be customary business hours unless reasonable cause exists to suspect noncompliance with the Act, Division 1200-3 or any permit issued pursuant thereto and the Technical Secretary specifically authorizes an inspector to inspect a facility at any other time.

TAPCR 1200-3-9-.02(11)(e)3.(ii)

**A11.** **Permit shield.**

**(a)** Compliance with the conditions of this permit shall be deemed compliance with all applicable requirements as of the date of permit issuance, provided that:

**1.** Such applicable requirements are included and are specifically identified in the permit; or

**2.** The Technical Secretary, in acting on the permit application or revision, determines in writing that other requirements specifically identified are not applicable to the source, and the permit includes the determination or a concise summary thereof.

**(b)** Nothing in this permit shall alter or affect the following:

**1.** The provisions of section 303 of the Federal Act (emergency orders), including the authority of the Administrator under that section. Similarly, the provisions of T.C.A. §68-201-109 (emergency orders) including the authority of the Governor under the section;

**2.** The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance;

**3.** The applicable requirements of the acid rain program, consistent with section 408(a) of the Federal Act; or

**4.** The ability of EPA to obtain information from a source pursuant to section 114 of the Federal Act.

**(c)** Permit shield is granted to the permittee.

**A12.** **Permit renewal and expiration.**

**(a)** Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted at least 180 days, but no more than 270 days prior to the expiration of this permit.

**(b)** Provided that the permittee submits a timely and complete application for permit renewal the source will not be considered in violation of paragraph 1200-3-9-.02(11) until the Technical Secretary takes final action on the permit application, except as otherwise noted in paragraph 1200-3-9-.02(11).

**(c)** This permit, its shield provided in Condition A11, and its conditions will be extended and effective after its expiration date provided that the source has submitted a timely, complete renewal application to the Technical Secretary.

TAPCR 1200-3-9-.02(11)(f)3 and 2, 1200-3-9-.02(11)(d)1(i)(III), and 1200-3-9-.02(11)(a)2

**A13.** **Reopening for cause.**

**(a)** A permit shall be reopened and revised prior to the expiration of the permit under any of the circumstances listed below:

**1.** Additional applicable requirements under the Federal Act become applicable to the sources contained in this permit provided the permit has a remaining term of 3 or more years. Such a reopening shall be completed not later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the permit expiration date of this permit, unless the original has been extended pursuant to 1200-3-9-.02(11)(a)2.

**2.** Additional requirements become applicable to an affected source under the acid rain program.

**3.** The Technical Secretary or EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.

**4.** The Technical Secretary or EPA determines that the permit must be revised or revoked to assure compliance with the applicable requirements.

**(b)** Proceedings to reopen and issue a permit shall follow the same proceedings as apply to initial permit issuance and shall affect only those parts of the permit for which cause to reopen exists, and not the entire permit. Such reopening shall be made as expeditiously as practicable.

**(c)** Reopenings for cause shall not be initiated before a notice of such intent is provided to the permittee by the Technical Secretary at least 30 days in advance of the date that the permit is to be reopened except that the Technical Secretary may provide a shorter time period in the case of an emergency. An emergency shall be established by the criteria of T.C.A. 68-201-109 or other compelling reasons that public welfare is being adversely affected by the operation of a source that is in compliance with its permit requirements.

**(d)** If the Administrator finds that cause exists to terminate, modify, or revoke and reissue a permit as identified in A13, he is required under federal rules to notify the Technical Secretary and the permittee of such findings in writing. Upon receipt of such notification, the Technical Secretary shall investigate the matter in order to determine if he agrees or disagrees with the Administrator's findings. If he agrees with the Administrator's findings, the Technical Secretary shall conduct the reopening in the following manner:

**1.** The Technical Secretary shall, within 90 days after receipt of such notification, forward to EPA a proposed determination of termination, modification, or revocation and reissuance, as appropriate. If the Administrator grants additional time to secure permit applications or additional information from the permittee, the Technical Secretary shall have the additional time period added to the standard 90 day time period.

**2.** EPA will evaluate the Technical Secretary's proposed revisions and respond as to their evaluation.

**3.** If EPA agrees with the proposed revisions, the Technical Secretary shall proceed with the reopening in the same manner prescribed under Condition A13 (b) and Condition A13 (c).

**4.** If the Technical Secretary disagrees with either the findings or the Administrator that a permit should be reopened or an objection of the Administrator to a proposed revision to a permit submitted pursuant to Condition A13(d), he shall bring the matter to the Board at its next regularly scheduled meeting for instructions as to how he should proceed. The permittee shall be required to file a written brief expressing their position relative to the Administrator's objection and have a responsible official present at the meeting to answer questions for the Board. If the Board agrees that EPA is wrong in their demand for a permit revision, they shall instruct the Technical Secretary to conform to EPA's demand, but to issue the permit under protest preserving all rights available for litigation against EPA.

TAPCR 1200-3-9-.02(11)(f)6 and 7.

**A14.** **Permit transference.** An administrative permit amendment allows for a change of ownership or operational control of a source where the Technical Secretary determines that no other change in the permit is necessary, provided that the following requirements are met:

**(a)** Transfer of ownership permit application is filed consistent with the provisions of 1200-3-9-.03(6), and

**(b)** written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to the Technical Secretary.

TAPCR 1200-3-9-.02(11)(f)4(i)(IV) and 1200-3-9-.03(6)

**A15.** **Air pollution alert.** When the Technical Secretary has declared that an air pollution alert, an air pollution warning, or an air pollution emergency exists, the permittee must follow the requirements for that episode level as outlined in TAPCR 1200-3-9-.03(1) and TAPCR 1200-3-15-.03.

**A16.** **Construction permit required.** Except as exempted in TAPCR 1200-3-9-.04 or excluded in subparagraph TAPCR 1200-3-2-.01(aa) or subparagraph TAPCR 1200-3-2-.01(1)(cc), this facility shall not begin the construction of a new air contaminant source or the modification of an air contaminant source which may result in the discharge of air contaminants without first having applied for and received from the Technical Secretary a construction permit for the construction or modification of such air contaminant source. The construction and operation of landfill waste disposal cells and landfill gas flares are exempt from the permitting requirements of this condition, except as the landfill operation may be regulated by the applicable requirements of 40 CFR 60, Subpart WWW.

TAPCR 1200-3-9-.01(1)(a) and 1200-3-4-.04(1)(g)

**A17.** **Notification of changes.** The permittee shall notify the Technical Secretary 30 days prior to commencement of any of the following changes to an air contaminant source which would not be a modification requiring a construction permit.

**(a)** change in air pollution control equipment

**(b)** change in stack height or diameter

**(c)** change in exit velocity of more than 25 percent or exit temperature of more than 15 percent based on absolute temperature.

TAPCR 1200-3-9-.02(7)

**A18.** **Schedule of compliance.** The permittee will comply with any applicable requirement that becomes effective during the permit term on a timely basis. If the permittee is not in compliance the permittee must submit a schedule for coming into compliance which must include a schedule of remedial measure(s), including an enforceable set of deadlines for specific actions.
TAPCR 1200-3-9-.02(11)(d)3 and 40 CFR Part 70.5(c)

**A19.** **Title VI.**

**(a)** The permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR, Part 82, Subpart F, except as provided for motor vehicle air conditioners (MVACs) in Subpart B:

**1.** Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to Section 82.156.

**2.** Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to Section 82.158.

**3.** Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to Section 82.161.

**(b)** If the permittee performs a service on motor (fleet) vehicles when this service involves ozone depleting substance refrigerant in the motor vehicle air conditioner (MVAC), the permittee is subject to all the applicable requirements as specified in 40 CFR, Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners.

**(c)** The permittee shall be allowed to switch from any ozone-depleting substance to any alternative that is listed in the Significant New Alternatives Program(SNAP) promulgated pursuant to 40 CFR, Part 82, Subpart G, Significant New Alternatives Policy Program.

**A20.** **112 (r).** The permittee shall comply with the requirement to submit to the Administrator or designated State Agency a risk management plan, including a registration that reflects all covered processes, by June 21, 1999, if the permittee's facility is required pursuant to 40 CFR, 68, to submit such a plan.

# SECTION B

# GENERAL CONDITIONS for MONITORING, REPORTING, and ENFORCEMENT

**B1.** **Recordkeeping.** Monitoring and related record keeping shall be performed in accordance with the requirements specified in the permit conditions for each individual permit unit. In no case shall reports of any required monitoring and record keeping be submitted less frequently than every six months.

**(a)** Where applicable, records of required monitoring information include the following:

**1.** The date, place as defined in the permit, and time of sampling or measurements;
**2.** The date(s) analyses were performed;
**3.** The company or entity that performed the analysis;
**4.** The analytical techniques or methods used;
**5.** The results of such analyses; and
**6.** The operating conditions as existing at the time of sampling or measurement.

**(b)** Digital data accumulation which utilizes valid data compression techniques shall be acceptable for compliance determination as long as such compression does not violate an applicable requirement and its use has been approved in advance by the Technical Secretary.

TAPCR 1200-3-9-.02(11)(e)1(iii)

**B2.** **Retention of monitoring data.** The permittee shall retain records of all required monitoring data and support information for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit.

TAPCR 1200-3-9.02(11)(e)1(iii)(II)II

**B3.** **Reporting.** Reports of any required monitoring and record keeping shall be submitted to the Technical Secretary in accordance with the frequencies specified in the permit conditions for each individual permit unit. Reports shall be submitted within 60 days of the close of the reporting period unless otherwise noted. All instances of deviations from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official. Reports required under "State only requirements" are not required to be certified by a responsible official.

TAPCR 1200-3-9-.02(11)(e)1(iii)

**B4.** **Certification.** Except for reports required under “State Only” requirements, any application form, report or compliance certification submitted pursuant to the requirements of this permit shall contain certification by a responsible official of truth, accuracy and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

TAPCR 1200-3-9-.02(11)(d)4

**B5.** **Annual compliance certification.** The permittee shall submit annually compliance certifications with terms and conditions contained in Sections A, B, D and E of this permit, including emission limitations, standards, or work practices. This compliance certification shall include all of the following (provided that the identification of applicable information may cross-reference the permit or previous reports, as applicable):

**(a)** The identification of each term or condition of the permit that is the basis of the certification;

**(b)** The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period;

**(c)** Whether such method(s) or other means provide continuous or intermittent data. Such methods and other means shall include, at a minimum, the methods and means required by this permit If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Federal Act, which prohibits knowingly making a false certification or omitting material information;

**(d)** The status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certification shall be based on the method or means designated in B5(b) above. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion* or exceedance** as defined below occurred; and

**(e)** Such other facts as the Technical Secretary may require to determine the compliance status of the source.

* "Excursion" shall mean a departure from an indicator range established for monitoring under this paragraph, consistent with any averaging period specified for averaging the results of the monitoring.

** "Exceedance" shall mean a condition that is detected by monitoring that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) are greater than the applicable emission limitation or standard (or less than the applicable standard in the case of a percent reduction requirement) consistent with any averaging period specified for averaging the results of the monitoring.

40 CFR Part 70.6(c)(5)(iii) as amended in the Federal Register Vol.62, No.204, October 22, 1997, pages 54946 and 54947

**B6.** **Submission of compliance certification.** The compliance certification shall be submitted to:

| | | |
|---|---|---|
| The Technical Secretary<br>Division of Air Pollution Control<br>ATTN: West Tennessee Permit Program<br>9th Floor, L & C Annex<br>401 Church Street<br>Nashville, Tennessee 37243-1531 | and | Air and EPCRA Enforcement Branch<br>US EPA Region IV<br>61 Forsyth Street, SW<br>Atlanta, Georgia 30303 |

TAPCR 1200-3-9-.02(11)(e)3(v)(IV)

**B7.** **Emergency provisions.** An emergency constitutes an affirmative defense to an enforcement action brought against this source for noncompliance with a technology based emission limitation due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

**(a)** The affirmative defense of the emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

**1.** An emergency occurred and that the permittee can identify the probable cause(s) of the emergency. "Probable" must be supported by a credible investigation into the incident that seeks to identify the causes and results in an explanation supported by generally accepted engineering or scientific principles.

**2.** The permitted source was at the time being properly operated. In determining whether or not a source was being properly operated, the Technical Secretary shall examine the source's written standard operating procedures which were in effect at the time of the noncompliance and any other code as detailed below that would be relevant to preventing the noncompliance. Adherence to the source's standard operating procedures will be the test of adequate preventative maintenance, careless operation, improper operation or operator error to the extent that such adherence would prevent noncompliance. The source's failure to follow recognized standards of practice to the extent that adherence to such a standard would have prevented noncompliance will disqualify the source from any claim of an emergency and an affirmative defense.

**3.** During the period of the emergency, the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit.

**4.** The permittee submitted notice of the emergency to the Technical Secretary according to the notification criteria for malfunctions in rule 1200-3-20-.03. For the purposes of this condition, "emergency" shall be substituted for "malfunction(s)" in rule 1200-3-20-.03 to determine the relevant notification threshold. The notice shall include a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

**(b)** In any enforcement proceeding the permittee seeking to establish the occurrence of an emergency has the burden of proof.

**(c)** The provisions of this condition are in addition to any emergency, malfunction or upset requirement contained in Division 1200-3 or other applicable requirement.

TAPCR 1200-3-9-.02(11)(e)7

**B8.** **Excess emissions reporting.**

**(a)** The permittee shall promptly notify the Technical Secretary when any emission source, air pollution control equipment, or related facility breaks down in such a manner to cause the emission of air contaminants in excess of the applicable emission standards contained in Division 1200-3 or any permit issued thereto, or of sufficient duration to cause damage to property or public health. The permittee must provide the Technical Secretary with a statement giving all pertinent facts, including the estimated duration of the breakdown. Violations of the visible emission standard which occur

for less than 20 minutes in one day (midnight to midnight) need not be reported. Prompt notification will be within 24 hours of the malfunction and shall be provided by telephone to the Division's Nashville office. The Technical Secretary shall be notified when the condition causing the failure or breakdown has been corrected. In attainment and unclassified areas if emissions other than from sources designated as significantly impacting on a nonattainment area in excess of the standards will not and do not occur over more than a 24-hour period (or will not recur over more than a 24-hour period) and no damage to property and or public health is anticipated, notification is not required.

**(b)** Any malfunction that creates an imminent hazard to health must be reported by telephone immediately to the Division's Nashville office and to the State Civil Defense.

**(c)** A log of all malfunctions, startups, and shutdowns resulting in emissions in excess of the standards in Division 1200-3 or any permit issued thereto must be kept at the plant. All information shall be entered in the log no later than twenty-four (24) hours after the startup or shutdown is complete, or the malfunction has ceased or has been corrected. Any later discovered corrections can be added in the log as footnotes with the reason given for the change. This log must record at least the following:

**1.** Stack or emission point involved
**2.** Time malfunction, startup, or shutdown began and/or when first noticed
**3.** Type of malfunction and/or reason for shutdown
**4.** Time startup or shutdown was complete or time the air contaminant source returned to normal operation
**5.** The company employee making entry on the log must sign, date, and indicate the time of each log entry

The information under items 1. and 2. must be entered into the log by the end of the shift during which the malfunction or startup began. For any source utilizing continuous emission(s) monitoring, continuous emission(s) monitoring collection satisfies the above log keeping requirement.

TAPCR 1200-3-20-.03 and .04

**B9.** **Malfunctions, startups and shutdowns - reasonable measures required.** The permittee must take all reasonable measures to keep emissions to a minimum during startups, shutdowns, and malfunctions. These measures may include installation and use of alternate control systems, changes in operating methods or procedures, cessation of operation until the process equipment and/or air pollution control equipment is repaired, maintaining sufficient spare parts, use of overtime labor, use of outside consultants and contractors, and other appropriate means. Failures that are caused by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions. This provision does not apply to standards found in 40 CFR, Parts 60(Standards of performance for new stationary sources), 61(National emission standards for hazardous air pollutants) and 63 (National emission standards for hazardous air pollutants for source categories).

TAPCR 1200-3-20-.02

**B10.** **Sources located in non-attainment areas or having significant impact on air quality in a non-attainment area.** The owner or operator of all sources located in non-attainment areas or having a significant impact on air quality in a non-attainment area (for the pollutant designated) must submit a report to the Technical Secretary within thirty (30) days after the end of each calendar quarter listing the times at which malfunctions, startups and/or shutdowns, which resulted in emissions greater than any applicable emission limits, occurred and the estimated amount of emissions discharged during such times. This report shall also include total emissions during the quarter and be reported in a format specified by the Technical Secretary.

TAPCR 1200-3-20-.04(2)

**B11.** **Report required upon the issuance of a notice of violation for excess emissions.** The permittee must submit within twenty (20) days after receipt of the notice of violation, the data shown below to assist the Technical Secretary in deciding whether to excuse or validate the violation. If this data has previously been available to the Technical Secretary prior to the issuance of the notice of violation no further action is required of the violating source. However, if the source desires to submit additional information, then this must be submitted within the same twenty (20) day time period. The minimum data requirements are:

**(a)** The identity of the stack and/or other emission point where the excess emission(s) occurred;

**(b)** The magnitude of the excess emissions expressed in pounds per hour and the units of the applicable emission limitation and the operating data and calculations used in determining the magnitude of the excess emissions;

**(c)** The time and duration of the emissions;

**(d)** The nature and cause of such emissions;

**(e)** For malfunctions, the steps taken to correct the situation and the action taken or planned to prevent the recurrence of such malfunctions;

**(f)** The steps taken to limit the excess emissions during the occurrence reported, and

**(g)** If applicable, documentation that the air pollution control equipment, process equipment, or processes were at all times maintained and operated in a manner consistent with good operating practices for minimizing emissions.

Failure to submit the required report within the twenty (20) day period specified shall preclude the admissibility of the data for consideration of excusal for malfunctions.

TAPCR 1200-3-20-.06(2),(3) and (4)

# SECTION C
# PERMIT CHANGES

**C1.** **Operational flexibility changes.** The source may make operational flexibility changes that are not addressed or prohibited by the permit without a permit revision subject to the following requirements:

**(a)** The change cannot be subject to a requirement of Title IV of the Federal Act or Chapter 1200-3-30.

**(b)** The change cannot be a modification under any provision of Title I of the federal Act or Division 1200-3.

**(c)** Each change shall meet all applicable requirements and shall not violate any existing permit term or condition.

**(d)** The source must provide contemporaneous written notice to the Technical Secretary and EPA of each such change, except for changes that are below the threshold of levels that are specified in Rule 1200-3-9-.04.

**(e)** Each change shall be described in the notice including the date, any change in emissions, pollutants emitted, and any applicable requirements that would apply as a result of the change.

**(f)** The change shall not qualify for a permit shield under the provisions of part 1200-3-9-.02(11)(e)6.

**(g)** The permittee shall keep a record describing the changes made at the source that result in emissions of a regulated air pollutant subject to an applicable requirement, but not otherwise regulated under the permit, and the emissions resulting from those changes. The records shall be retained until the changes are incorporated into subsequently issued permits.

TAPCR 1200-3-9-.02(11)(a)4 (ii)

**C2.** **Section 502(b)(10) changes.**

**(a)** The permittee can make certain changes without requiring a permit revision, if the changes are not modifications under Title I of the Federal Act or Division 1200-3 and the changes do not exceed the emissions allowable under the permit. The permittee must, however, provide the Administrator and Technical Secretary with written notification within a minimum of 7 days in advance of the proposed changes. The Technical Secretary may waive the 7 day advance notice in instances where the source demonstrates in writing that an emergency necessitates the change. Emergency shall be demonstrated by the criteria of TAPCR 1200-3-9-.02(11)(e)7 and in no way shall it include changes solely to take advantages of an unforeseen business opportunity. The Technical Secretary and EPA shall attach each such notice to their copy of the relevant permit.

**(b)** The written notification must be signed by a facility Title V responsible official and include the following:

**1.** brief description of the change within the permitted facility;

**2.** specifies the date on which the change will occur;

**3.** declares and quantifies where possible any change in emissions;

**4.** declares any permit term or condition that is no longer applicable as a result of the change; and

**5.** declares the requested change is not a Title I modification and will not exceed allowable emissions under the permit.

**(c)** The permit shield provisions of TAPCR 1200-3-9-.02(11)(e)6 shall not apply to Section 502(b)(10) changes.

TAPCR 1200-3-9-.02(11)(a)4 (i)

**C3.** **Administrative amendment.**

**(a)** Administrative permit amendments to this permit shall be in accordance with 1200-3-9-.02(11)(f)4. The source may implement the changes addressed in the request for an administrative amendment immediately upon submittal of the request.

**(b)** The permit shield shall be extended as part of an administrative permit amendment revision consistent with the provisions of TAPCR 1200-3-9-.02(11)(e)6 for such revisions made pursuant to item (c) of this condition which meet the relevant requirements of TAPCR 1200-3-9-.02(11)(e), TAPCR 1200-3-9-.02(11)(f) and TAPCR 1200-3-9-.02(11)(g) for significant permit modifications.

**(c)** Proceedings to review and grant administrative permit amendments shall be limited to only those parts of the permit for which cause to amend exists, and not the entire permit.

TAPCR 1200-3-9-.02(11)(f)4

**C4.** **Minor permit modifications.**

**(a)** The permittee may submit an application for a minor permit modification in accordance with TAPCR 1200-3-9-.02(11)(f)5(ii).

**(b)** The permittee may make the change proposed in its minor permit modification immediately after an application is filed with the Technical Secretary.
**(c)** Proceedings to review and modify permits shall be limited to only those parts of the permit for which cause to modify exists, and not the entire permit.
**(d)** Minor permit modifications do not qualify for a permit shield.

TAPCR 1200-3-9-.02(11)(f)5(ii)

**C5.** **Significant permit modifications.**
**(a)** The permittee may submit an application for a significant modification in accordance with TAPCR 1200-3-9-.02(11)(f)5(iv).
**(b)** Proceedings to review and modify permits shall be limited to only those parts of the permit for which cause to modify exists, and not the entire permit.

TAPCR 1200-3-9-.02(11)(f)5(iv)

**C6.** **New construction or modifications.**
Future construction at this source that is subject to the provisions of TAPCR 1200-3-9-.01 shall be governed by the following:
**(a)** The permittee shall designate in their construction permit application the route that they desire to follow for the purposes of incorporating the newly constructed or modified sources into their existing operating permit. The Technical Secretary shall use that information to prepare the operating permit application submittal deadlines in their construction permit.
**(b)** Sources desiring the permit shield shall choose the administrative amendment route of TAPCR 1200-3-9-.02(11)(f)4 or the significant modification route of TAPCR 1200-3-9-.02(11)(f)5(iv).
**(c)** Sources desiring expediency instead of the permit shield shall choose the minor permit modification procedure route of TAPCR 1200-3-9-.02(11)(f)5(ii) or group processing of minor modifications under the provisions of TAPCR 1200-3-9-.02(11)(f)5(iii) as applicable to the magnitude of their construction.

TAPCR 1200-3-9-.02(11)(d) 1(i)(V)

# SECTION D

# GENERAL APPLICABLE REQUIREMENTS

**D1.** **Visible emissions.** With the exception of air emission sources exempt from the requirements of TAPCR Chapter 1200-3-5 and air emission sources for which a different opacity standard is specifically provided elsewhere in this permit, the permittee shall not cause, suffer, allow or permit discharge of a visible emission from any air contaminant source with an opacity in excess of twenty (20) percent for an aggregate of more than five (5) minutes in any one (1)hour or more than twenty (20) minutes in any twenty-four (24) hour period; provided, however, that for fuel burning installations with fuel burning equipment of input capacity greater than 600 million btu per hour, the permittee shall not cause, suffer, allow, or permit discharge of a visible emission from any fuel burning installation with an opacity in excess of twenty (20) percent (6-minute average) except for one six minute period per one (1) hour of not more than forty (40) percent opacity. Sources constructed or modified after July 7, 1992 shall utilize 6-minute averaging.

Consistent with the requirements of TAPCR Chapter 1200-3-20, due allowance may be made for visible emissions in excess of that permitted under TAPCR 1200-3-5 which are necessary or unavoidable due to routine startup and shutdown conditions. The facility shall maintain a continuous, current log of all excess visible emissions showing the time at which such conditions began and ended and that such record shall be available to the Technical Secretary or his representative upon his request.

TAPCR 1200-3-5-.01(1), TAPCR 1200-3-5-.03(6) and TAPCR 1200-3-5-.02(1)

**D2.** **General provisions and applicability for non-process gaseous emissions.** Any person constructing or otherwise establishing a non-portable air contaminant source emitting gaseous air contaminants after April 3, 1972, or relocating an air contaminant source more than 1.0 km from the previous position after November 6, 1988, shall install and utilize the best equipment and technology currently available for controlling such gaseous emissions.

TAPCR 1200-3-6-.03(2)

**D3.** **Non-process emission standards.** The permittee shall not cause, suffer, allow, or permit particulate emissions from non-process sources in excess of the standards in TAPCR 1200-3-6.

**D4.** **General provisions and applicability for process gaseous emissions.** Any person constructing or otherwise establishing an air contaminant source emitting gaseous air contaminants after April 3, 1972, or relocating an air contaminant source more than 1.0 km from the previous position after November 6, 1988, shall install and utilize equipment and technology which is deemed reasonable and proper by the Technical Secretary.

TAPCR 1200-3-7-.07(2)

**D5.** **Particulate emissions from process emission sources.** The permittee shall not cause, suffer, allow, or permit particulate emissions from process sources in excess of the standards in TAPCR 1200-3-7.

**D6.** **Sulfur dioxide emission standards.** The permittee shall not cause, suffer, allow, or permit Sulfur dioxide emissions from process and non-process sources in excess of the standards in TAPCR 1200-3-14. Regardless of the specific emission standard, new process sources shall utilize the best available control technology as deemed appropriate by the Technical Secretary of the Tennessee Air Pollution Control Board.

**D7.** **Fugitive Dust.**

**(a)** The permittee shall not cause, suffer, allow, or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, but not be limited to, the following:

**1.** Use, where possible, of water or chemicals for control of dust in demolition of existing buildings or structures, construction operations, grading of roads, or the clearing of land;

**2.** Application of asphalt, oil, water, or suitable chemicals on dirt roads, material stock piles, and other surfaces which can create airborne dusts;

**3.** Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting or other similar operations.

**(b)** The permittee shall not cause, suffer, allow, or permit fugitive dust to be emitted in such manner to exceed five (5) minutes per hour or twenty (20) minutes per day as to produce a visible emission beyond the property line of the property on which the emission originates, excluding malfunction of equipment as provided in Chapter 1200-3-20.

TAPCR 1200-3-8

**D8.** **Open burning.** The permittee shall comply with the TAPCR 1200-3-4-.04 for all open burning activities at the facility.

TAPCR 1200-3-4

**D9.** **Asbestos.** Where applicable, the permittee shall comply with the requirements of 1200-3-11-.02(d) when conducting any renovation or demolition activities at the facility.

TAPCR 1200-3-11-.02(d) and 40 CFR, Part 61

**D10.** **Annual certification of compliance.** The generally applicable requirements set forth in Section D of this permit are intended to apply to activities and sources that are not subject to source-specific applicable requirements contained in State of Tennessee and U.S. EPA regulations. By annual certification of compliance, the permittee shall be considered to meet the monitoring and related record keeping and reporting requirements of TAPCR 1200-3-9-.02(11)(e)1.(iii) and 1200-3-10-.04(2)(b)1 and compliance requirements of TAPCR 1200-3-9-.02(11)(e)3.(i). The permittee shall submit compliance certification for these conditions annually.

# SECTION E

# SOURCE SPECIFIC EMISSION STANDARDS, OPERATING LIMITATIONS, and MONITORING, RECORDKEEPING and REPORTING REQUIREMENTS

| | | |
|---|---|---|
| **37-0080** | **Facility Description:** | West Camden Sanitary Landfill is a municipal solid waste landfill located in Camden. The facility is subject to the NSPS requirements of 40 CFR 60, Subpart WWW for Municipal Solid Waste Landfills. This facility is also subject to the MACT requirements of 40 CFR 63 Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills. In 1992 this landfill reached the capacity to handle above 2.5 million Mg of trash and had a trash storage volume in excess of 2.5 million cubic meters and thus became subject to the above NSPS requirements. Since this landfill reached the threshold capacity after the EPA effective date of May 30, 1991, this landfill is not considered as an existing landfill. Additionally, the non-methane organic compound (NMOC) emissions exceeded 50 Mg/yr requiring a gas collection system as stipulated in Subpart WWW. The landfill has been operating a gas collection and control system with an open (utility) flare for gas combustion since 1997. The current capacity of this landfill after a 2002 expansion is 19,487,611 cubic meters of storage volume. Currently 162 acres of the landfill facility are permitted for solid waste disposal. |

Conditions E1 through E20 apply to this source.

**E1. Fee payment: actual emissions basis.**

**FEE EMISSIONS SUMMARY TABLE FOR MAJOR SOURCE 03-0045**

| REGULATED POLLUTANTS | ALLOWABLE EMISSIONS (tons per AAP) | ACTUAL EMISSIONS (tons per AAP) | COMMENTS |
|---|---|---|---|
| PARTICULATE MATTER (PM) | N/A | N/A | |
| $PM_{10}$ | N/A | N/A | |
| $SO_2$ | N/A | N/A | |
| VOC | N/A | AEAR | See Notes Below **** |
| $NO_X$ | N/A | N/A | |
| CATEGORY OF MISCELLANEOUS HAZARDOUS AIR POLLUTANTS (HAP WITHOUT A STANDARD)* | | | |
| VOC FAMILY GROUP | N/A | N/A | See Notes Below **** |
| NON-VOC GASEOUS GROUP | N/A | N/A | See Notes Below **** |
| PM FAMILY GROUP | N/A | N/A | |
| CATEGORY OF SPECIFIC HAZARDOUS AIR POLLUTANTS (HAP WITH A STANDARD)** | | | |
| VOC FAMILY GROUP | N/A | N/A | |
| NON-VOC GASEOUS GROUP | N/A | N/A | |
| PM FAMILY GROUP | N/A | N/A | |
| CATEGORY OF NSPS POLLUTANTS NOT LISTED ABOVE*** | | | |
| EACH NSPS POLLUTANT NOT LISTED ABOVE | N/A | N/A | |

**NOTES**

**AAP** The **Annual Accounting Period** (**AAP**) is a twelve (12) consecutive month period that **begins each July 1st and ends June 30th of the following year**. The **present Annual Accounting Period began July 1, 2009 and ends June 30, 2010**. The **next Annual Accounting Period begins July 1, 2010 and ends June 30, 2011**.

**N/A** **N/A** indicates that no emissions are specified for fee computation.

**AEAR** **AEAR** indicates that an **A**ctual **E**missions **A**nalysis is **R**equired to determine the actual emissions of:

**(1)** **each regulated pollutant** (Particulate matter, $SO_2$, VOC, $NO_X$ and so forth. See TAPCR 1200-3-26-.02(2)(i) for the definition of a regulated pollutant.),

**(2)** **each pollutant group** (VOC Family, Non-VOC Gaseous, and Particulate Family), and

**(3)** the **Miscellaneous HAP Category**

under consideration during the **Annual Accounting Period**.

***** **Category Of Miscellaneous HAP (HAP Without A Standard):** This category is made-up of hazardous air pollutants that do not have a Federal or State standard. Each HAP is classified into one of three groups, the **VOC Family** group**, the Non-VOC Gaseous** group**,** or the **Particulate (PM) Family** group**. For fee computation**, the **Miscellaneous HAP Category** is subject to the 4,000 ton cap provisions of subparagraph 1200-3-26-.02(2)(i).

****** **Category Of Specific HAP (HAP With A Standard):** This category is made-up of hazardous air pollutants (HAP) that are subject to Federally promulgated Hazardous Air Pollutant Standards that can be imposed under Chapter 1200-3-11 or Chapter 1200-3-31. Each individual hazardous air pollutant is classified into one of three groups, the **VOC Family** group**, the Non-VOC Gaseous** group**,** or the **Particulate (PM) Family** group**. For fee computation**, each individual hazardous air pollutant of the **Specific HAP Category** is subject to the 4,000 ton cap provisions of subparagraph 1200-3-26-.02(2)(i).

******* **Category Of NSPS Pollutants Not Listed Above:** This category is made-up of each **N**ew **S**ource **P**erformance **S**tandard (**NSPS**) pollutant whose emissions are not included in the **PM**, **$SO_2$, VOC** or **$NO_X$** emissions from each source in this permit. **For fee computation**, each **NSPS pollutant not listed above** is subject to the 4,000 ton cap provisions of subparagraph 1200-3-26-.02(2)(i).

**** **VOC of Fee Table:** Includes uncollected/ uncontrolled emissions from landfill only. Emissions from flare not included for fees.

**HAP of Fee Table:** negligible amounts of HAPs may be emitted per AP-42 emission factors.

## END NOTES

**The permittee shall:**

**(1)** Pay major source annual **actual based emission fees**, as requested by the responsible official, for each **annual accounting period** (AAP) by July 1 of each year.

**(2)** Prepare an **actual emissions analysis** in accordance with the above **Fee Emissions Summary Table** for each AAP (July 1 of each year through June 30 of the following year). The **actual emissions analysis** shall include:

**(a)** the completed **Fee Emissions Summary Table**, **and**

**(b)** each **AEAR** required by the above **Fee Emissions Summary Table.** Methodology for calculation of AEAR shall follow the emissions inventory and calculation methods described in Attachment A, LandGem model of the permittee's application of May 30, 2003. Refer to Attachment 1 of this permit.

**(3)** Submit the **actual emissions analysis** at the time the fees are paid in full.

**(4)** Calculate the fee due based upon the **actual emissions analysis**, and submit the payment on July 1st following the end of the **annual accounting period**. If any part of any fee imposed under TAPCR 1200-3-26-.02 is not paid within fifteen (15) days of the due date, penalties shall at once accrue as specified in TAPCR 1200-3-26-.02(8). Major sources may request an extension of time to file their emissions analysis with the Technical Secretary as specified in Condition A8(c)5 of this permit. Emissions for regulated pollutants shall not be double counted as specified in Condition A8(d) of this permit.

**Payment of the fee due and the actual emissions analysis shall be submitted to The Technical Secretary at the address in Condition E2 of this permit.**

TAPCR 1200-3-26-.02 (3) and (9), and 1200-3-9-.02(11)(e)1 (iii) and (vii)

**E2.** **Reporting requirements**.

**(a)** **Semiannual reports.** Reporting periods shall be January 1 through June 30 and July 1 through December 31 of each calendar year. The Semiannual reports shall be submitted within 60 days after the end of each June 30 and December 31 of each year. All instances of deviations from permit requirements must be clearly identified in these reports and the reports must be certified by a responsible official.

Semiannual reports of this facility (03-0045) shall include:

**(1)** Any monitoring and recordkeeping required by Conditions ***E4, E6, E9, E13, E15, and E16*** of this permit. A summary report of this data is acceptable provided there is sufficient information to enable the Technical Secretary to evaluate compliance. All data shall be presented in a clear, legible format that allows the Technical Secretary to evaluate compliance.

**(2)** Any applicable semiannual reports otherwise required by 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 63 (National Emission Standards for Hazardous Air Pollutants for Source Categories) may be submitted as a part of the semiannual report required by Condition E2-1(a) of this permit. A summary report of this data is acceptable provided there is sufficient information to enable the Technical Secretary to evaluate compliance.

**(3)** Identification of all instances of deviations from **ALL PERMIT REQUIREMENTS**.

**These reports shall be submitted to The Technical Secretary at the address in Condition E2(b) of this permit.**

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**(b)** **Annual compliance certification.** The permittee shall submit annually compliance certifications with terms and conditions contained in Sections A, B, D and E of this permit, including emission limitations, standards, or work practices. This compliance certification shall include all of the following (provided that the identification of applicable information may cross-reference the permit or previous reports, as applicable):

**(1)** The identification of each term or condition of the permit that is the basis of the certification;

**(2)** The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period;

**(3)** Whether such method(s) or other means provide continuous or intermittent data. Such methods and other means shall include, at a minimum, the methods and means required by this permit. If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Federal Act, which prohibits knowingly making a false certification or omitting material information;

**(4)** The status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certification shall be based on the method or means designated in E2(b)(2) above. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an *excursion or **exceedance as defined below occurred; and

**(5)** Such other facts as the Technical Secretary may require to determine the compliance status of the source.

*"Excursion" shall mean a departure from an indicator range established for monitoring under this paragraph, consistent with any averaging period specified for averaging the results of the monitoring.

**"Exceedance" shall mean a condition that is detected by monitoring that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) are greater than the applicable emission limitation or standard (or less than the applicable standard in the case of a percent reduction requirement) consistent with any averaging period specified for averaging the results of the monitoring.

**These certifications shall be submitted within 60 days after the end of each calendar year.**

**These certifications shall be submitted to: Tennessee Division of Air Pollution Control TN APCD and EPA**

| | | |
|---|---|---|
| **The Technical Secretary**<br>**Division of Air Pollution Control**<br>**ATTN: West Tennessee Permit Program**<br>**9th Floor, L & C Annex**<br>**401 Church Street**<br>**Nashville, Tennessee 37243-1531** | **and** | **Air and EPCRA Enforcement Branch**<br>**US EPA Region IV**<br>**61 Forsyth Street, SW**<br>**Atlanta, Georgia 30303** |

40 CFR Part 70.6(c)(5)(iii) as amended in the Federal Register Vol.62, No.204, October 22, 1997, pages 54946 and 54947.

**E3.** The landfill gas collection system is controlled by an open flare at the West Camden Sanitary Landfill. The flare is subject to TAPCR 1200-3-16-.01(11) and §60.18, which require the following for flares:

**(a)** The flare shall be designed for and operated with no visible emissions as determined by Reference Method 22 with a consecutive 2 hour observation period, except for periods not to exceed a total of five minutes during any two consecutive hours.

**(b)** The flare shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermocouple or some other equivalent device. At any time that a flame is not present at the flare tip, the system should be shut down immediately;

**(c)** The net heating value of the gas being combusted must be 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or the net heating value of the gas being combusted must be 7.45 MJ/scm (200 Btu/scf) or greater for non-assisted flares. The net heating value of the gas being combusted shall be determined by the methods specified in TAPCR 1200-3-16-.01(11)(f); and

**(d)** **(i)** Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in TAPCR 1200-3-16-.01(11)(f)4 less than 18.3 m /sec (60 ft/ sec), except as provided in (ii) and (iii) below.

**(ii)** Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in TAPCR 1200-3-16-.01(11)(f)4 equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1000 Btu/scf).

**(iii)** Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in TAPCR 1200-3-16-.01(11)(f)4 less than velocity, Vmax, as determined by the method specified in TAPCR 1200-3-16-.01(11)(f)5 and less than 122 m/sec (400 ft/sec) are allowed.

**(e)** Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the methods specified in TAPCR 1200-3-16-.01(11)(f)6.

**(f)** Flares shall be steam-assisted, air-assisted, or nonassisted.

TAPCR 1200-3-16-.01(11)(b), (c), (d), (e), and (f); §60.752 and §60.18

**Compliance Method:** Compliance shall be assured by a flare performance test as required by Condition E11 (new or reconstructed flares only) and the operation and monitoring of control equipment required by Condition E4.

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E4.** For open flares, the installation, calibration, maintenance, and operation of the following equipment is required:

**(a)** The flare shall be operated with a flame present at all times. The presence of a flare pilot flame shall be monitored using a thermocouple or some other equivalent device. At any time that a flame is not present at the flare tip, the system shall be shut down immediately;

**(b)** The flare shall be equipped with a device that records flow to or bypass of the flare. The source shall either:

**(i)** Install, calibrate and maintain a gas flow rate measuring device that shall record the flow to the control device at least once every 15 minutes; or

**(ii)** Secure the bypass line valve in the closed position with a car-seal or lock-and-key configuration. A visual inspection of the seal of the closure mechanism shall be performed at least once every month to ensure the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line;

§60.756(c)

**Compliance Method:** Compliance shall be assured by the recordkeeping specified in Conditions E13(a), (b) and (c).

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E5.** The permittee shall operate each interior wellhead in the collection system with a negative pressure except as noted in §60.753(b), a landfill gas temperature less than 55 $^{O}$C (131 $^{O}$F), and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The permittee may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

**(a)** The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by §60.752(b)(2)(i).

**(b)** Unless an alternative test method is established as allowed by §60.752(b)(2)(i), the oxygen level shall be determined by an oxygen meter using Method 3A except as provided in §60.753(c)(2).

§60.753(b) and (c)

**Compliance Method:** Compliance shall be assured by the monitoring and recordkeeping required by Condition E6.

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E6.** The permittee shall install a sampling port and a thermometer or other temperature measuring device, or an access port for temperature measurements at each wellhead and:

**(a)** Measure the gauge pressure in the gas collection header at each individual well on a monthly basis as provided in §60.755(a)(3). If positive pressure exists, corrective action shall be initiated within 5 calendar days to correct the exceedance as specified in §60.755(a)(3). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Technical Secretary for approval. The alternative must include a justification

of any proposed exceedance of the corrective action timeline prescribed by §60.755(a)(3). As long as the specified actions of this condition are taken and the alternative timeline (if applicable) is approved by the Technical Secretary, the exceedance is not a violation of the operational requirements of §60.755(a)(3);

**(b)** Monitor the temperature of the landfill gas and the nitrogen or oxygen concentration in the landfill gas at each well on a monthly basis as provided in §60.755(a)(5). If a well exceeds either the nitrogen or oxygen operating parameters or the temperature operating parameter of Condition E5, action shall be initiated to correct the exceedance within 5 calendar days as specified in §60.755(a)(5). If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Technical Secretary for approval. The alternative must include a justification of any proposed exceedance of the corrective action timeline prescribed by §60.755(a)(5). As long as the specified actions of this condition are taken and the alternative timeline (if applicable) is approved by the Technical Secretary, the exceedance is not a violation of the operational requirements of §60.755(a)(5).

The compliance provisions of this condition apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed one (1) hour for the control device.

§§ 60.755(a)(3) and (5), 60.755(e), 60.753(g), and 60.756(a)

**Compliance Method:** Compliance shall be assured by maintaining a log of monthly monitoring of the operating parameters specified in this condition.

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E7.** The permittee shall operate the landfill gas collection system such that gas is collected from each area, cell, or group of cells in which solid waste has been in place for:

**(a)** 5 years or more if active; or

**(b)** 2 years or more if closed or at final grade

For expansion of the existing gas collection system, each new well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period specified in (a) or (b) of this condition.

§60.753(a) and §60.755(b)

**Compliance Method:** Compliance shall be assured by compliance with the recordkeeping requirements of Condition E13(d).

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E8.** The permittee shall operate the landfill gas collection system such that all collected gases are vented to the control system designed and operated in compliance with §60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas shall be closed within 1 hour. The control system shall be operated at all times when the collected gas is routed to the system.

§60.753(e) and (f)

**Compliance Method:** Compliance shall be assured by compliance with the recordkeeping requirements of Conditions E13(b), (c) and (d).

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E9.** **(a)** The permittee shall operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill as specified in §60.753(d). Surface testing shall be conducted around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site specific established spacing) and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover, on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in §60.755(d). The permittee may establish an alternative traversing pattern that ensures equivalent coverage. Areas with steep slopes or other dangerous areas may be excluded from the surface testing. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells. Surface monitoring shall be performed in accordance with Section 4.3.1 of Method 21 of Appendix A of Part 60; except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions. A surface monitoring design plan that includes an updated topographical map with the surface monitoring route and the rationale for any site-specific deviations from the 30 meter monitoring intervals shall be maintained at the facility. Surface monitoring shall be conducted at each area, cell, or group of cells in which the initial solid waste has been placed for a period of five years or more.

**(b)** Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in E9(b)(i) through (v) shall be taken. As long as the following specified actions are taken, the exceedance is not a violation of the operational requirements of §60.753(d).

**(i)** The location of each monitored exceedance shall be marked and the location recorded.

**(ii)** Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.

**(iii)** If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in E9(b)(v) shall be taken, and no further monitoring of that location is required until the action specified in E9(b)(v) has been taken.

**(iv)** Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in E9(b)(ii) or (iii) shall be re-monitored no later than one (1) month after the initial exceedance. If the one-month remonitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the one-month remonitoring shows an exceedance, the actions specified in E9(b)(iii) or (v) shall be taken.

**(v)** For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Technical Secretary for approval.

**(c)** The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

The compliance provisions of this condition apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for the control device.

§§ 60.753(d) and 60.755(c) and (e)

**Compliance Method:** Compliance shall be assured by maintaining a log of the monitoring requirements specified in this condition.

TAPCR 1200-3-9-.02(11)(e)1.(iii)

**E10**. Except as provided in §60.752(b)(2)(i)(B), the permittee shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered §60.752(b), the current amount of solid waste in place, and the year by year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

§60.758(a)

**E11.** For all new or reconstructed flares installed at this source, an initial open flare performance test shall be conducted in accordance with TAPCR 1200-3-16-.01(11) and §60.8. The performance test shall include an initial visible emissions evaluation, and the test results shall be included in the report required by Condition E16. At least ten (10) days prior to conducting the performance test, the Technical Secretary shall be given notice of the test date.

**E12.** Except as provided in §60.752(b)(2)(i)(B), the source shall keep the following records for the life of the control equipment (open flare) as measured during the most recent flare performance test:

**(a)** The flare type (i.e. steam-assisted, air-assisted, or nonassisted);

**(b)** All visible emissions readings;

**(c)** The heat content determination;

**(d)** Flow rate or bypass flow rate measurements; and

**(e)** Exit velocity determinations made during the most recent flare performance test;

**(f)** Continuous records of the of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent;

**(g)** The maximum expected gas generation flow rate as calculated in §60.755(a)(1) and the density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in §60.759(a)(1).

Records of subsequent tests or monitoring shall be maintained for a minimum of five (5) years. Records of control device vendor specifications shall be maintained until removal.

§60.758(b)(1) and (4)

**E13**. Except as provided in §60.752(b)(2)(i)(B), the following records shall be maintained for at least five years and made available for inspection upon request:

**(a)** Continuous records of the equipment operating parameters specified to be monitored in §60.756 (see Conditions E4 and E6) as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded;

**(b)** Records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under §60.756 (see Condition E4);

**(c)** Records of the flame or flare pilot flame monitoring specified under §60.756(c) (see Condition E4), and all periods of operation in which the flame or flare pilot flame is absent; and

**(d)** Records of all collection and control system exceedances of the operational standards outlined in §60.753 (see Conditions E5, E7, E8, and E9), the reading in the subsequent month, whether or not the second reading is an exceedance, and the location of each exceedance.

§60.758(c) and (e)

**E14.** **MACT requirements**. 40 CFR 63 Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste landfills.

**(a)** The permittee shall comply with all applicable requirements of 40 CFR Part 63 Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills as required by 40 CFR §§ 63.1930 – 63.1990. Compliance with this condition does not relieve the permittee of the responsibility to comply with all applicable requirements of 40 CFR Part 63 Subpart AAAA.

**(b)** The permittee shall comply with all applicable requirements of 40 CFR 63.6, Compliance with Standards and Maintenance Requirements, and 40 CFR 63.10(b), General Recordkeeping and Reporting Requirements. This includes the requirement to develop and implement a written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction and a program of corrective action for malfunctioning process and air pollution control equipment used to comply with the standards as required by §63.1960.

The plan must include the following minimum plan elements:

**(i)** Procedures to determine and record the cause of the malfunction and the time the malfunction began and ended; and

**(ii)** Corrective actions to be taken in the event of a malfunction of a process or control device, including procedures for recording the actions taken to correct the malfunction or minimize emissions.

**(c)** *Periodic startup, shutdown, and malfunction reports*. If actions taken by an owner or operator during a startup, shutdown, or malfunction of an affected source (including actions taken to correct a malfunction) are consistent with the procedures specified in the source's startup, shutdown, and malfunction plan (see §63.6(e)(3)), the owner or operator shall state such information in a startup, shutdown, and malfunction report. Such a report shall identify any instance where any action taken by an owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the affected source's startup, shutdown, and malfunction plan, but the source does not exceed any applicable emission limitation in the relevant emission standard. Such a report shall also include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. Reports shall only be required if a startup, shutdown, or malfunction occurred during the reporting period. The startup, shutdown, and malfunction report shall consist of a letter, containing the name, title, and signature of the owner, operator, or other responsible official who is certifying its accuracy. The startup, shutdown, and malfunction report shall be submitted with the semiannual report required by Condition E16.

**(d)** *Immediate startup, shutdown, and malfunction reports*. At any time an action taken by an owner or operator during a startup, shutdown, or malfunction (including actions taken to correct a malfunction) is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, and the source exceeds any applicable emission limitation in the relevant emission standard, the owner or operator shall report the actions taken for that event within 2 working days after commencing actions inconsistent with the plan followed by a letter within 7 working days after the end of the event. The immediate report required under this paragraph (d)(5)(ii) shall consist of a telephone call (or facsimile transmission) to the Technical Secretary within 2 working days, and it shall be followed by a letter, delivered or postmarked within 7 working days after the end of the event. The letter shall contain the name, title, and signature of the owner, operator, or other responsible official who is certifying its accuracy, explaining the circumstances of the event, the reasons for not following the startup, shutdown, and malfunction plan, and describing all excess emissions and/or parameter monitoring exceedances which are believed to have occurred.

40 CFR §§ 63.6, 63.1960, 63.1980

**E15.** **Title V semiannual report**. The permittee shall submit a semiannual compliance monitoring report within 60 days after the end of each reporting period identified in Condition E2(a) of this permit. Each report must include the following:

**(a)** A record of any time periods during the reporting period during which a wellhead was operating at a positive pressure;

**(b)** A record of any time periods during the reporting period during which a wellhead was operating at a landfill gas temperature greater than 55° C;

**(c)** A record of any time periods during the reporting period during which a wellhead was operating with a nitrogen level greater than 20 percent or an oxygen level greater than 5 percent;

**(d)** A record of any time periods during the reporting period during which the flow of landfill gas to the open flare was interrupted;

**(e)** A record of any time periods during the reporting period during which a flame was not present on the open flare. The record must include the nature of the malfunction, and any corrective actions taken; and

**(f)** A record of any time periods during the reporting period during which a surface methane reading exceeded 500 parts per million above background.

TAPCR 1200-3-9-.02(11)(e)1(iii)

**E16**. **NSPS and MACT semiannual report**. The permittee shall submit a semiannual report of the recorded information outlined below. The report shall be due within 60 days after the end of each reporting period identified in Condition E2(a) of this permit. Each report must include the following:

**(a)** Value and length of time for exceedance of applicable parameters monitored under §60.756(a) and (c) (see Conditions E4 and E6);

**(b)** Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or indication of bypass flow as specified under §60.756 (see Condition E4);

**(c)** Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time the control device was not operating;

**(d)** All periods when the collection system was not operating in excess of 5 days;

**(e)** The location of each exceedance of the 500 parts per million methane concentration as provided in §60.753 (d) (see Condition E9) and the concentration recorded at each location for which an exceedance was recorded in the previous month; and

**(f)** The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), and (c)(4) of §60.755 (see Conditions E6(a), E7, and E9(b)).

**(g)** Startup, shutdown, and malfunction reports required by Condition E14(c).

The exceedances reported for this condition do not automatically constitute a violation of the requirements of §60.753 provided that good operational practices are utilized for the collection and control system.

§60.757(f)

**E17.** Except as provided in §60.752(b)(2)(i)(B), the permittee shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

**(a)** The permittee shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified in §60.755(b) (see Condition E7).

**(b)** The permittee shall keep up-to-date, readily accessible records of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in §60.759(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in §60.759(a)(3)(ii).

§60.758(d)

**E18.** If the controlled landfill ceases operation, the permittee shall submit to the Technical Secretary a closure report within 30 days of waste acceptance cessation. The Technical Secretary may request additional information as may be necessary to verify that permanent closure has taken place. If a closure report has been submitted to the Technical Secretary, no additional wastes may be placed into the landfill without filing a notification of modification as described under §60.7(a)(4).

§60.757(d)

**E19.** The permittee shall submit an equipment removal report to the Technical Secretary 30 days prior to the removal or cessation of operation of the control equipment. The report shall contain the following items:

**(a)** A copy of the closure report submitted in accordance with §60.757(d) (see Condition E18);

**(b)** A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; and

**(c)** Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year.

The Technical Secretary may request additional information as may be necessary to verify that all of the conditions for removal specified in Condition E20 have been met.

§60.757(e)

**E20.** The collection and control system may be capped or removed provided that all the of the following conditions are met:

**(a)** The landfill shall be a closed landfill as defined in §60.751. A closure report shall be submitted to the Technical Secretary as provided in §60.757(d) (see Condition E18);

**(b)** The collection and control system shall have been in operation a minimum of 15 years; and

**(c)** Following the procedures specified in §60.754(b), the calculated NMOC gas produced by the landfill shall be less than 50 megagrams (Mg)per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.

§60.752(b)(2)(v)

**END OF PERMIT NUMBER 556483**

# ATTACHMENT 1
# CALCULATION OF EMISSIONS

## West Camden Sanitary Landfill
## Method utilized to calculate NMOC and VOC emissions using

# EPA Landfill Gas Emissions Model (LandGem) version 3.02 and incorporating AP-42 default values

As per Condition E1. Of Title V Permit No.: 548537, an actual emissions analysis is only required for VOCs. This emissions analysis assumes that the amount of VOCs equals 38% of the total amount of NMOCs (per AP-42).

Using the U.S. EPA Landfill Gas Emissions Model, version 3.02, uncollected NMOC emissions from the landfill were determined. The NMOC emissions are calculated using the AP-42 equation listed below and the emissions are based on AP-42 default values and waste acceptance rates provided by Waste Management. These values are further detailed below.

**AP-42 Equation:**

$M_{NMOC} = 1.82L_oR(e^{-kc} - e^{-kt})(C_{NMOC})(\text{Conv. Factor})$

Note: As per AP-42 the 1.82 in the equation above assumes 55% methane ($CH_4$) in the landfill gas.

**AP-42 & Site-Specific Values:**

| | | |
|---|---|---|
| R= | varies (Mg/yr) | From Site's Annual Refuse Receipts |
| k= | 0.04 (1/yr) | AP-42 Default Value |
| $L_o$= | 100 ($m^3$/Mg) | AP-42 Default Value |
| $C_{NMOC}$= | 595 (ppm-h) | AP-42 Default Value |
| $CH_4$ Conc. | 55% | AP-42 Default Value |
| c= | varies (years) | Years since closure |
| t= | varies (years) | Age of Landfill |
| Collection Efficiency= | 75% | Assumed AP-42 Value |

**Annual Refuse Acceptance Rates:**

| Year | Mass of Waste Accepted (Tons) | Mass of Waste Accepted (Mg) |
|---|---|---|
| 1994 | 206,682 | 188,759 |
| 1995 | 282,540 | 256,546 |
| 1996 | 250,064 | 227,056 |
| 1997 | 257,400 | 233,719 |
| 1998 | 351,830 | 319,462 |
| 1999 | 470,370 | 427,098 |
| 2000 | 452,986 | 411,313 |
| 2001 | 480,949 | 436,702 |
| 2002 | 358,821 | 325,809 |
| 2003 | 407,888 | 370,380 |
| 2004 | 492,406 | 447,105 |
| 2005 | 478,210 | 434,215 |
| 2006 | 598,197 | 543,163 |
| 2007 | 653,197 | 593,103 |
| 2008 | 681,749 | 600,868 |
| | | 5,813,278 |

**Model NMOC / VOC Emission Rates:**

| Year | NMOC Emissions (Mg/yr) | NMOC Emissions (Tons/yr) | VOC Emissions (Tons/yr) | Uncollected (25%) VOC Emissions (Tons/yr) |
|---|---|---|---|---|
| 1995 | 2.90 | 3.19 | 1.24 | 0.31 |
| 1996 | 6.75 | 7.43 | 2.90 | 0.72 |
| 1997 | 10.00 | 11.01 | 4.29 | 1.07 |
| 1998 | 13.35 | 14.70 | 5.73 | 1.43 |
| 1999 | 17.93 | 19.75 | 7.70 | 1.93 |
| 2000 | 23.88 | 26.30 | 10.25 | 2.56 |
| 2001 | 29.43 | 32.41 | 12.64 | 3.16 |
| 2002 | 35.05 | 38.60 | 15.05 | 3.76 |
| 2003 | 38.73 | 42.65 | 16.64 | 4.16 |
| 2004 | 42.95 | 47.30 | 18.45 | 4.61 |
| 2005 | 48.20 | 53.08 | 20.70 | 5.18 |
| 2006 | 51.82 | 57.07 | 22.26 | 5.56 |
| 2007 | 58.07 | 63.95 | 24.94 | 6.24 |
| 2008 | 64.82 | 71.39 | 27.84 | 6.96 |
| 2009 | 71.44 | 78.67 | 30.68 | 7.67 |

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL

NOT TO BE USED FOR TITLE V APPLICATIONS

9th Floor, L & C Annex
401 Church Street
Nashville, TN 37243-1531
Telephone: ( 615 ) 532-0554
FAX: ( 615 ) 532-0614

# PERMIT APPLICATION

APC 20

PLEASE TYPE OR PRINT AND SUBMIT IN DUPLICATE FOR EACH EMISSION SOURCE. ATTACH APPROPRIATE SOURCE DESCRIPTION FORMS.

| | | | |
|---|---|---|---|
| **1. ORGANIZATION'S LEGAL NAME**<br>West Camden Sanitary Landfill | | / / /<br>FOR | APC COMPANY--POINT NO. |
| **2. MAILING ADDRESS** (ST/RD/P.O. BOX)<br>2410 Highway 70 West | | / / /<br>APC | APC LOG/PERMIT NO. |
| CITY<br>Camden | STATE<br>Tennessee | ZIP CODE<br>38320 | PHONE WITH AREA CODE<br>(901) 584-7734 |
| **3. PRINCIPAL TECHNICAL CONTACT**<br>David Thorley | | | PHONE WITH AREA CODE<br>(713) 328-7404 |
| **4. SITE ADDRESS** (ST/RD/HWY)<br>2410 Highway 70 West | | | COUNTY NAME<br>Benton |
| CITY OR DISTANCE TO NEAREST TOWN<br>Camden, Tennessee | | ZIP CODE<br>38320 | PHONE WITH AREA CODE<br>(901) 584-7734 |
| **5. EMISSION SOURCE NO.** (NUMBER WHICH UNIQUELY IDENTIFIES THIS SOURCE)[1]<br>03-0045-01 | | PERMIT RENEWAL<br>YES ( ) NO ( X ) | |

**6. BRIEF DESCRIPTION OF EMISSION SOURCE**

Three (3) Reciprocating Engines (landfill gas-fired).

This APC 20 is for the construction of three (3) Reciprocating Engines, No's. 1, 2, & 3 (E1, E2, & E3). The Reciprocating Engines are Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engines. The engines are rated at 2233 BHP at 100% load, and have a fuel consumption of 7994 Btu/bhp-hr (17.85 MM Btu/hr). The reciprocating internal combustion engines will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with the existing open process flare unit to control landfill gas emissions.

**7. TYPE OF PERMIT REQUESTED**

| | | | | |
|---|---|---|---|---|
| CONSTRUCTION<br>( X ) | STARTING DATE<br>June 1, 2010 | COMPLETION DATE<br>18 months after commencement of construction | LAST PERMIT NUMBER<br>556483 (draft) | EMISSION SOURCE REFERENCE NUMBER<br>03-0045 |
| OPERATING<br>( ) | DATE CONSTRU-CTION | DATE COMPLETED | LAST PERMIT NUMBER | EMISSION SOURCE REFERENCE NUMBER |
| LOCATION TRANSFER<br>( ) | TRANSFER DATE | | LAST PERMIT NUMBER | EMISSION SOURCE REFERENCE NUMBER |

ADDRESS OF LAST LOCATION

**8. DESCRIBE CHANGES THAT HAVE BEEN MADE TO THIS EQUIPMENT OR OPERATION SINCE THE LAST CONSTRUCTION OR OPERATING PERMIT APPLICATION.**

N/A

| | | |
|---|---|---|
| **9. SIGNATURE** (APPLICATION MUST BE SIGNED BEFORE IT WILL BE PROCESSED) | | **DATE**<br>6/30/2010 |
| **10. SIGNER'S NAME** (TYPE OR PRINT)<br>Charles R. Gillian | **TITLE**<br>VP O | **PHONE WITH AREA CODE**<br>615-517-4997 |

(OVER)

CN-0730

RDA 1298

[1] Proposed source number 01.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L&C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## OPERATIONS AND FLOW DIAGRAMS

1. PLEASE LIST, IDENTIFY AND DESCRIBE BRIEFLY PROCESS EMISSION SOURCES, FUEL BURNING INSTALLATIONS, AND INCINERATORS THAT ARE CONTAINED IN THIS APPLICATION. PLEASE ATTACH A FLOW DECAGRAM FOR THIS APPLICATION.

Application is for the construction of three (3) Caterpillar (CAT) G3520C low emissions; spark ignited, turbo charged, after-cooled engines. The engines will be fired by landfill gas.

The proposed description of this process is:

**Three (3) Reciprocating Internal Combustion Engines:** Landfill gas fired. Engines (PES E1, E2, and E3) are Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled units. Each engine is rated at a nominal fuel capacity of 17.85 MM Btu/hr (combined capacity of 53.55 MM BTUs per hour). Engines (PES E1, E2, and E3) have individual emission stacks (emission points E1S, E2S, and E3S). The reciprocating internal combustion engines will be fired with landfill gas (LFG).

*[1]Diagram: Emission release point identifications E1S-E3S refer to the emissions from the reciprocating internal combustion engines. Emission release point OF1S refers to the existing 4,000 scfm open process flare.

2. LIST ALL INSIGNIFICANT ACTIVITIES WHICH ARE EXEMPTED BECAUSE OF SIZE OR PRODUCTION RATE AND CITE THE APPLICABLE REGULATIONS.

N/A

3. ARE THERE ANY STORAGE PILES?

YES _____ NO ____X_____

4. LIST THE STATES THAT ARE WITHIN 50 MILES OF YOUR FACILITY

Kentucky

5. PAGE NUMBER: 2 REVISION NUMBER: 1 DATE OF REVISION 6/25/2010



[1] See Attachment: Figure No. 1.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
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401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## EMISSION SUMMARY FOR THE FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION

1. FACILITY NAME:
West Camden Sanitary Landfill

2. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS AT THIS FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION.[1]

| AIR POLLUTANT | SUMMARY OF MAXIMUM ALLOWABLE EMISSIONS | | SUMMARY OF ACTUAL EMISSIONS[1] | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 4, APC V.28 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 4, APC V.28 ) |
| PARTICULATES ( TSP ) | N/A | | 20.06 | |
| SULFUR DIOXIDE | N/A | | 127.84 | |
| VOLATILE ORGANIC COMPOUNDS | N/A | | 12.83 | |
| CARBON MONOXIDE | N/A | | 414.83 | |
| LEAD | N/A | | N/A[2] | |
| NITROGEN OXIDES | N/A | | 73.44 | |
| TOTAL REDUCED SULFUR | N/A | | Included in $SO_2$ | |
| MERCURY | N/A | | 0.00023 | |
| ASBESTOS | N/A | | N/A[2] | |
| BERYLLIUM | N/A | | N/A[2] | |
| VINYL CHLORIDES | N/A | | 0.00948 | |
| FLUORIDES | N/A | | N/A[2] | |
| GASEOUS FLUORIDES | N/A | | N/A[2] | |
| Total 112(b) Hazardous Air Pollutants (including HCl). | N/A | | 6.553 | |

( CONTINUED ON NEXT PAGE )



[1] Source emissions included in this APC Form V.29 are reciprocating engine No's. E1, E2, and E3 and landfill gas combusted by existing open flare OF1. Landfill gas emissions controlled by the open flare No. OF1 will not change because the capacity of the landfill gas generation rate will not change.

[2] Emissions of this pollutant are assumed negligible from municipal solid waste landfills.

( CONTINUED FROM PREVIOUS PAGE )

3. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT ( S ) AT THIS FACILITY OR FOR THE SOURCES CONTAINED IN THIS APPLICATION.

| AIR POLLUTANT & CAS | SUMMARY OF MAXIMUM ALLOWABLE EMISSIONS | | SUMMARY OF ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 5, APC V.28 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 5, APC V.28 ) |
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4. PAGE NUMBER: 3 & 4 REVISION NUMBER: 1 DATE OF REVISION: 6/25/2010

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L & C ANNEX
401 CHURCH STREET
NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STATIONARY GAS TURBINE OR INTERNAL COMBUSTION ENGINE

1. FACILITY NAME:
West Camden Sanitary Landfill

2. LIST ALL GAS TURBINES AND INTERNAL COMBUSTION ENGINES AT THIS FACILITY ON A SEPARATE SHEET, AND PLEASE COMPLETE AN APC V.5 FORM FOR EACH PIECE OF EQUIPMENT.
Reciprocating Internal Combustion Engine (E1)

3. MANUFACTURER AND MODEL NUMBER:
Caterpillar (CAT) G3520C low emissions

4. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION( S ):
E1S

5. EQUIPMENT DESCRIPTION:
Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engine. The engine is rated at 2233 BHP at 100% load, and has a fuel consumption of 7994 Btu/bhp-hr (17.85 MM Btu/hr). The reciprocating internal combustion engine will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with open process flare unit to control landfill gas emissions.

6. DATE OF INSTALLATION OR LAST MODIFICATION OF EQUIPMENT:
New construction

7. RATED HEAT INPUT CAPACITY ( IN MILLION BTU/HOUR ) AND HORSE POWER:

17.85 MM BTUs per Hour / 2233 BHP

STATE WHICH HEATING VALUE WAS UTILIZED:

____X____ HIGHER HEATING VALUE

_____ LOWER HEATING VALUE

8. IF EQUIPMENT IS GAS TURBINE, LIST TYPE. N/A

_____ SIMPLE CYCLE

_____ REGENERATIVE CYCLE

_____ COMBINED CYCLE

9. FUELS:

| | PRIMARY FUEL | BACKUP FUEL #1 | BACKUP FUEL #2 | BACKUP FUEL #3 |
|---|---|---|---|---|
| FUEL NAME | Landfill Gas | N/A | N/A | N/A |
| ACTUAL YEARLY CONSUMPTION | 309.02 MM $sft^3$ | N/A | N/A | N/A |

10. ( FOR NSPS TURBINES ONLY ) MANUFACTURER'S RATED HEAT RATE AT MANUFACTURER'S RATED PEAK LOAD ( KILOJOULES PER WATT HOUR ), OR ACTUAL MEASURED HEAT RATE BASED ON LOWER HEATING VALUE OF FUEL AS MEASURED AT ACTUAL PEAK LOAD FOR THE UNIT:
N/A

11. LOCATION OF THIS FUEL BURNING INSTALLATION IN UTM COORDINATES:

UTM VERTICAL: 634.000 UTM HORIZONTAL: 1,336.500

12. NORMAL OPERATING SCHEDULE:

24 HRS/DAY 7 DAYS/WK 365 DAYS/YR

13. PAGE NUMBER: 8 REVISION NUMBER: 1 DATE OF REVISION: 6/25/2010

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STATIONARY GAS TURBINE OR INTERNAL COMBUSTION ENGINE

1. FACILITY NAME:
West Camden Sanitary Landfill

2. LIST ALL GAS TURBINES AND INTERNAL COMBUSTION ENGINES AT THIS FACILITY ON A SEPARATE SHEET, AND PLEASE COMPLETE AN APC V.5 FORM FOR EACH PIECE OF EQUIPMENT.
Reciprocating Internal Combustion Engine (E2)

3. MANUFACTURER AND MODEL NUMBER:
Caterpillar (CAT) G3520C low emissions

4. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION( S ):
E2S

5. EQUIPMENT DESCRIPTION:
Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engine. The engine is rated at 2233 BHP at 100% load, and has a fuel consumption of 7994 Btu/bhp-hr (17.85 MM Btu/hr). The reciprocating internal combustion engine will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with open process flare unit to control landfill gas emissions.

6. DATE OF INSTALLATION OR LAST MODIFICATION OF EQUIPMENT:
New construction

7. RATED HEAT INPUT CAPACITY ( IN MILLION BTU/HOUR ) AND HORSE POWER:

17.85 MM BTUs per Hour / 2233 BHP

STATE WHICH HEATING VALUE WAS UTILIZED:

____X____ HIGHER HEATING VALUE

_____ LOWER HEATING VALUE

8. IF EQUIPMENT IS GAS TURBINE, LIST TYPE. N/A

_____ SIMPLE CYCLE

_____ REGENERATIVE CYCLE

_____ COMBINED CYCLE

9. FUELS:

| | PRIMARY FUEL | BACKUP FUEL #1 | BACKUP FUEL #2 | BACKUP FUEL #3 |
|---|---|---|---|---|
| FUEL NAME | Landfill Gas | N/A | N/A | N/A |
| ACTUAL YEARLY CONSUMPTION | 309.02 MM $sft^3$ | N/A | N/A | N/A |

10. ( FOR NSPS TURBINES ONLY ) MANUFACTURER'S RATED HEAT RATE AT MANUFACTURER'S RATED PEAK LOAD ( KILOJOULES PER WATT HOUR ), OR ACTUAL MEASURED HEAT RATE BASED ON LOWER HEATING VALUE OF FUEL AS MEASURED AT ACTUAL PEAK LOAD FOR THE UNIT:
N/A

11. LOCATION OF THIS FUEL BURNING INSTALLATION IN UTM COORDINATES:

UTM VERTICAL: 634.000 UTM HORIZONTAL: 1,336.500

12. NORMAL OPERATING SCHEDULE:

24 HRS/DAY 7 DAYS/WK 365 DAYS/YR

13. PAGE NUMBER: 9 REVISION NUMBER: 1 DATE OF REVISION: 6/25/2010

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DIVISION OF AIR POLLUTION CONTROL
9TH FLOOR, L & C ANNEX
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NASHVILLE, TN 37243-1531



# MAJOR SOURCE OPERATING PERMIT APPLICATION
## STATIONARY GAS TURBINE OR INTERNAL COMBUSTION ENGINE

1. FACILITY NAME:
West Camden Sanitary Landfill

2. LIST ALL GAS TURBINES AND INTERNAL COMBUSTION ENGINES AT THIS FACILITY ON A SEPARATE SHEET, AND PLEASE COMPLETE AN APC V.5 FORM FOR EACH PIECE OF EQUIPMENT.
Reciprocating Internal Combustion Engine (E3)

3. MANUFACTURER AND MODEL NUMBER:
Caterpillar (CAT) G3520C low emissions

4. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION( S ):
E3S

5. EQUIPMENT DESCRIPTION:
Caterpillar (CAT) G3520C low emissions, spark ignited, turbo charged, after-cooled engine. The engine is rated at 2233 BHP at 100% load, and has a fuel consumption of 7994 Btu/bhp-hr (17.85 MM Btu/hr). The reciprocating internal combustion engine will be fired with landfill gas (LFG). The reciprocating internal combustion engines are used along with open process flare unit to control landfill gas emissions.

6. DATE OF INSTALLATION OR LAST MODIFICATION OF EQUIPMENT:
New construction

7. RATED HEAT INPUT CAPACITY ( IN MILLION BTU/HOUR ) AND HORSE POWER:

17.85 MM BTUs per Hour / 2233 BHP

STATE WHICH HEATING VALUE WAS UTILIZED:

____X____ HIGHER HEATING VALUE

_____ LOWER HEATING VALUE

8. IF EQUIPMENT IS GAS TURBINE, LIST TYPE. N/A

_____ SIMPLE CYCLE

_____ REGENERATIVE CYCLE

_____ COMBINED CYCLE

9. FUELS:

| | PRIMARY FUEL | BACKUP FUEL #1 | BACKUP FUEL #2 | BACKUP FUEL #3 |
|---|---|---|---|---|
| FUEL NAME | Landfill Gas | N/A | N/A | N/A |
| ACTUAL YEARLY CONSUMPTION | 309.02 MM $sft^3$ | N/A | N/A | N/A |

10. ( FOR NSPS TURBINES ONLY ) MANUFACTURER'S RATED HEAT RATE AT MANUFACTURER'S RATED PEAK LOAD ( KILOJOULES PER WATT HOUR ), OR ACTUAL MEASURED HEAT RATE BASED ON LOWER HEATING VALUE OF FUEL AS MEASURED AT ACTUAL PEAK LOAD FOR THE UNIT:
N/A

11. LOCATION OF THIS FUEL BURNING INSTALLATION IN UTM COORDINATES:

UTM VERTICAL: 634.000 UTM HORIZONTAL: 1,336.500

12. NORMAL OPERATING SCHEDULE:

24 HRS/DAY 7 DAYS/WK 365 DAYS/YR

13. PAGE NUMBER: 10 REVISION NUMBER: 1 DATE OF REVISION: 6/25/2010

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# MAJOR SOURCE OPERATING PERMIT APPLICATION
## EMISSIONS FROM PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR

1. FACILITY NAME:
West Camden Sanitary Landfill

2. STACK ID OR FLOW DIAGRAM POINT IDENTIFICATION ( S ):
E1S, E2S, E3S

3. PROCESS EMISSION SOURCE / FUEL BURNING INSTALLATION / INCINERATOR ( IDENTIFY ):
Emission Source Reference No. : 03-0045-01 – Three (3) Reciprocating Engines (landfill gas-fired)

4. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS. FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

| AIR POLLUTANT | MAXIMUM ALLOWABLE EMISSIONS | | ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 7, APC V.30 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 8, APC V.30 ) |
| PARTICULATES ( TSP ) | N/A | | 11.12 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| SULFUR DIOXIDE | N/A | | 39.12 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| VOLATILE ORGANIC COMPOUNDS | N/A | | 12.35 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| CARBON MONOXIDE | N/A | | 226.20 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| LEAD | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| NITROGEN OXIDES | N/A | | 38.78 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| TOTAL REDUCED SULFUR | N/A | | Included in $SO_2$ | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| MERCURY | N/A | | 0.00007 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |

( CONTINUED ON NEXT PAGE )



[1] Emissions of this pollutant are assumed negligible from municipal solid waste landfills.

( CONTINUED FROM LAST PAGE )

| AIR POLLUTANT | MAXIMUM ALLOWABLE EMISSIONS | | ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 7, APC V.30 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 8, APC V.30 ) |
| ASBESTOS | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| BERYLLIUM | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| VINYL CHLORIDE | N/A | | 0.00576 | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| FLUORIDES | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
| GASEOUS FLUORIDES | N/A | | N/A[1] | |
| ( FUGITIVE EMISSIONS ) | N/A | | N/A | |
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5. COMPLETE THE FOLLOWING EMISSIONS SUMMARY FOR REGULATED AIR POLLUTANTS THAT ARE HAZARDOUS AIR POLLUTANT ( S ). FUGITIVE EMISSIONS SHALL BE INCLUDED. ATTACH CALCULATIONS AND EMISSION FACTOR REFERENCES.

| AIR POLLUTANT & CAS | MAXIMUM ALLOWABLE EMISSIONS | | ACTUAL EMISSIONS | |
|---|---|---|---|---|
| | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 7, APC V.30 ) | TONS PER YEAR | RESERVED FOR STATE USE ( POUNDS PER HOUR- ITEM 8, APC V.30 ) |
| | | | | |
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6. PAGE NUMBER: 19 & 20 REVISION NUMBER: 1 DATE OF REVISION 6/25/2010



[1] Emissions of this pollutant are assumed negligible from municipal solid waste landfills per AP-42, Section 2.4.

**Title V Permit No. 556483** **Waste Management - West Camden Sanitary Landfill**

**Renewable Energy Project**

**Potential Emissions Summary**

| | Open Flare (OF1S) | | E1S, E2S, E3S (new engines) | | Total of All Point Sources | |
|---|---|---|---|---|---|---|
| **HAPs Identified** | **HAP Emissions (lb/hr)** | **HAP Emissions (tons/yr)** | **HAP Emissions (lb/hr)** | **HAP Emissions (tons/yr)** | **HAP Emissions (lb/hr)** | **HAP Emissions (tons/yr)** |
| 1,1,1-Trichloroethane (methylchloroform) | 0.00028 | 0.00124 | 0.00040 | 0.00192 | 0.00068 | 0.00316 |
| 1,1,2,2-Tetrachloroethane | 0.00015 | 0.00065 | 0.00021 | 0.00100 | 0.00036 | 0.00166 |
| 1,1-Dichloroethane (ethylidene dichloride) | 0.00014 | 0.00061 | 0.00052 | 0.00251 | 0.00066 | 0.00312 |
| 1,1-Dichloroethene(vinylidene chloride) | 0.00011 | 0.00049 | 0.00016 | 0.00076 | 0.00027 | 0.00126 |
| 1,2-Dichloroethane (ethylene dichloride) | 0.00015 | 0.00066 | 0.00021 | 0.00102 | 0.00036 | 0.00167 |
| 1,2-Dichloropropane (propylene dichloride) | 0.00003 | 0.00014 | 0.00005 | 0.00022 | 0.00008 | 0.00037 |
| Acrylonitrile | 0.00000 | 0.00002 | 0.00001 | 0.00007 | 0.00002 | 0.00008 |
| Benzene - Co-Disposal | 0.00154 | 0.00673 | 0.00575 | 0.02772 | 0.00729 | 0.03445 |
| Carbon disulfide | 0.00005 | 0.00020 | 0.00017 | 0.00083 | 0.00022 | 0.00104 |
| Carbon tetrachloride | 0.00001 | 0.00006 | 0.00002 | 0.00009 | 0.00003 | 0.00015 |
| Carbonyl sulfide | 0.00002 | 0.00009 | 0.00008 | 0.00038 | 0.00010 | 0.00047 |
| Chlorobenzene | 0.00032 | 0.00142 | 0.00045 | 0.00218 | 0.00078 | 0.00360 |
| Chloroethane (ethyl chloride) | 0.00020 | 0.00085 | 0.00027 | 0.00132 | 0.00047 | 0.00217 |
| Chloroform | 0.00003 | 0.00014 | 0.00004 | 0.00021 | 0.00008 | 0.00035 |
| Dichlorobenzene | 0.00299 | 0.01309 | 0.00419 | 0.02020 | 0.00718 | 0.03328 |
| Dichloromethane (methylenechloride) | 0.00365 | 0.01597 | 0.00512 | 0.02466 | 0.00876 | 0.04063 |
| Ethylbenzene | 0.00137 | 0.00599 | 0.00512 | 0.02465 | 0.00648 | 0.03064 |
| Ethylene dibromide (1,2 Dibromoethane) | 0.00011 | 0.00048 | 0.00015 | 0.00074 | 0.00026 | 0.00122 |
| Hexane | 0.00038 | 0.00166 | 0.00142 | 0.00685 | 0.00180 | 0.00851 |
| Mercury (total) | 0.00004 | 0.00016 | 0.00001 | 0.00007 | 0.00005 | 0.00023 |
| Methyl isobutyl ketone | 0.00014 | 0.00062 | 0.00053 | 0.00257 | 0.00068 | 0.00319 |
| Perchloroethylene (tetrachloroethylene) | 0.00250 | 0.01096 | 0.00351 | 0.01692 | 0.00601 | 0.02787 |
| Toluene | 0.00655 | 0.02867 | 0.02450 | 0.11802 | 0.03104 | 0.14669 |
| Trichloroethylene (trichloroethene) | 0.00113 | 0.00496 | 0.00159 | 0.00765 | 0.00272 | 0.01261 |
| Vinyl chloride | 0.00085 | 0.00373 | 0.00119 | 0.00576 | 0.00205 | 0.00948 |
| Xylenes (mixed isomers) | 0.00334 | 0.01463 | 0.01250 | 0.06020 | 0.01584 | 0.07483 |
| **Totals** | 0.02608 | 0.11424 | 0.06818 | 0.32851 | 0.09426 | 0.44274 |
| | | | | | | |
| Hydrochloric Acid (HCl) | 0.96810 | 4.24027 | 0.38811 | 1.86990 | 1.35620 | 6.11017 |
| | | | | | | |
| | | | | | Total HAPs | 6.55291 |

**Criteria Pollutants**

| | Open Flare (OF1S) | | E1S, E2S, E3S (new engines) | | Total of All Point Sources | |
|---|---|---|---|---|---|---|
| | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** |
| NOx | 7.91 | 34.67 | 8.85 | 38.78 | 16.77 | 73.44 |
| CO | 43.07 | 188.63 | 51.64 | 226.20 | 94.71 | 414.83 |
| $PM/PM_{10}/PM_{2.5}$ | 2.04 | 8.93 | 2.54 | 11.12 | 4.58 | 20.06 |
| $SO_2$ | 20.25 | 88.72 | 8.12 | 39.12 | 28.37 | 127.84 |
| VOC (engine max. based on 1.0 g/hp-hr) | | | 14.76 | | 14.76 | |
| VOC (annual) | 0.11 | 0.47 | | 12.35 | | 12.83 |

**Note:**

1) The VOC max. hourly for the engines is 1.0 gr/hp-hr per Subpart JJJJ.

2) The VOC engine PTE is based on 20 ppmv (7% $O_2$) in engine exhaust.

**Title V Permit No. 556483**

**Waste Management - West Camden Sanitary Landfill**
**Renewable Energy Project**
**E1S, E2S, E3S Reciprocating Internal Combustion Engines Criteria Pollutant Emission Calculations**

**Engine Data**

| Parameter | | Units | | Parameter | | Units |
|---|---|---|---|---|---|---|
| CAT G3520C BHP | 2,233 | Bhp | | Methane HHV | 1,012 | Btu/cf |
| Fuel Consumption | 6,354 | Btu/bhp-hr | (ISO) | LFG Concentration | 55% | lb/hr basis |
| Fuel Consumption | 7,994 | Btu/bhp-hr | (Nominal) | LFG Concentration | 50% | annual basis |
| Nominal Fuel Heat Rating | 17,850,000 | Btu/hr | (Nominal) | LFG Heat value | 506 | Btu/cf |
| Nominal Fuel Heat Rating | 17.85 | MM Btu/hr | (Nominal) | Engine Exhaust Flow | 3,450 | dscfm (7% $O_2$) |
| LFG Flowrate (required to meet the max. heat input) | 32,070 | cf/hr | 534 | cfm | **lb/hr basis** | |
| $CH_4$ Flowrate | 17,638 | cf/hr | 294 | cfm | **lb/hr basis** | |
| | | | | | | **Annual Consumption** / **Unit** |
| LFG Flowrate | 35,277 | cf/hr | 588 | cfm | **annual basis** | 309.02 / MM cf |
| $CH_4$ Flowrate | 17,638 | cf/hr | 294 | cfm | **annual basis** | |

**Methane Values**

**(1)(2)(3) Engine Emission Factors**

| | | | | | |
|---|---|---|---|---|---|
| NOx | 0.6 | g/bhp-hr | TRS | 500 | ppmv (inlet as $H_2S$) |
| CO | 3.5 | g/bhp-hr | VOC | 1.0 | g/bhp-hr (outlet) |
| $PM/PM_{10}/PM_{2.5}$ | 48 | lb/MMcf Methane | VOC | 20.0 | ppmv - annual basis, 7% $O_2$ |

**notes:**
1) Emission Factors for $SO_2$ are based on 500 ppmv of TRS (primarily $H_2S$) in the LFG.
2) PM EF per AP-42, Table 2.4-5; all is assumed $PM_{2.5}$.
3) 1.0 gr per Hpr-hr for VOC per Subpart JJJJ assumed as maximum VOC hourly concentration.
4) Engine exhaust flow estimated at 7% O2 per Caterpillar specifications.

**(1)(2)(3)(4)(5) Criteria Pollutant Emissions For CAT G3520C Engines**
*(calculations are for Nominal fuel consumption per engine)*

| | | | | | Per Engine Basis | | Total of Three Engines | | |
|---|---|---|---|---|---|---|---|---|---|
| | **E.F.** | **Units** | **Molecular Weight (lb/lb-mol)** | **Destruction Efficiency %** | **Emission Rate (lb/hr)** | **Emission Rate (ton/yr)** | **-3 Engines - Emission Rate (lb/hr)** | **- 3 Engines - Emission Rate (ton/yr)** | **Comment(s)** |
| NOx | 0.6 | g/bhp-hr | - | - | 2.95 | 12.93 | 8.85 | 38.78 | |
| CO | 3.5 | g/bhp-hr | - | - | 17.21 | 75.40 | 51.64 | 226.20 | |
| $PM/PM_{10}/PM_{2.5}$ | 48.0 | lb/MMcf Methane | - | - | 0.85 | 3.71 | 2.54 | 11.12 | |
| $SO_2$ | 500 | ppm ($H_2S$ inlet) | 64.06 | - | 2.71 | 13.04 | 8.12 | 39.12 | 55% $CH_4$ on lb/hr, 50% $CH_4$ annual basis |
| VOC | 1.0 | g/bhp-hr (outlet) | | - | 4.92 | - | 14.76 | - | |
| VOC (annual basis) | 20.0 | ppmv @ 7% $O_2$ (hexane) | 86.18 | - | 0.94 | 4.12 | 2.82 | 12.35 | |

**notes:**
1) 379.50 cf/lb-mole @ standard conditions
2) 55% CH4 on lb/hr, 50% CH4 annual basis. Based on engine heat requirement more LFG is required to fuel the engine at the 50% annual CH4 concentration.
3) Total reduced sulfur (TRS) concentration is considered primarily $H_2S$. 500 ppmv is the estimated maximum content of the LFG.
4) Annual Engine VOC annual emissions are based on 20 ppmv @ 7% $O_2$ in engine exhaust.
5) NOx and CO emission factors are provided by the manufacturer.

Title V Permit No. 556483

# Waste Management - West Camden Sanitary Landfill
## Renewable Energy Project
## E1S, E2S, E3S Reciprocating Internal Combustion Engines HAPs Pollutant Emission Calculations

| | | | | | Per Engine | | Three Engines (total) | |
|---|---|---|---|---|---|---|---|---|
| HAPs Identified [1], [2], [3], [4] | CAS Number | Molecular Weight (lbm/lbmol) | Average Concentration of LFG (ppmv) | [6] Engine Destruction Efficiency % | HAP Emissions (lb/hr) | HAP Emissions (tons/yr) | HAP Emissions (lb/hr) | HAP Emissions (tons/yr) |
| 1,1,1-Trichloroethane (methylchloroform) | 71-55-6 | 133.41 | 0.168 | 93.0% | 0.00013 | 0.00064 | 0.00040 | 0.00192 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | 167.85 | 0.070 | 93.0% | 0.00007 | 0.00033 | 0.00021 | 0.00100 |
| 1,1-Dichloroethane (ethylidene dichloride) | 75-34-3 | 98.97 | 0.741 | 97.2% | 0.00017 | 0.00084 | 0.00052 | 0.00251 |
| 1,1-Dichloroethene(vinylidene chloride) | 75-35-4 | 96.94 | 0.092 | 93.0% | 0.00005 | 0.00025 | 0.00016 | 0.00076 |
| 1,2-Dichloroethane (ethylene dichloride) | 107-06-2 | 98.96 | 0.120 | 93.0% | 0.00007 | 0.00034 | 0.00021 | 0.00102 |
| 1,2-Dichloropropane (propylene dichloride) | 78-87-5 | 112.99 | 0.023 | 93.0% | 0.00002 | 0.00007 | 0.00005 | 0.00022 |
| Acrylonitrile | 107-13-1 | 53.06 | 0.036 | 97.2% | 0.00000 | 0.00002 | 0.00001 | 0.00007 |
| Benzene - Co-Disposal | 71-43-2 | 78.11 | 10.376 | 97.2% | 0.00192 | 0.00924 | 0.00575 | 0.02772 |
| Carbon disulfide | 75-15-0 | 76.13 | 0.320 | 97.2% | 0.00006 | 0.00028 | 0.00017 | 0.00083 |
| Carbon tetrachloride | 56-23-5 | 153.84 | 0.007 | 93.0% | 6.370E-06 | 3.069E-05 | 0.00002 | 0.00009 |
| Carbonyl sulfide | 463-58-1 | 60.07 | 0.183 | 97.2% | 0.00003 | 0.00013 | 0.00008 | 0.00038 |
| Chlorobenzene | 108-90-7 | 112.56 | 0.227 | 93.0% | 0.00015 | 0.00073 | 0.00045 | 0.00218 |
| Chloroethane (ethyl chloride) | 75-00-3 | 64.52 | 0.239 | 93.0% | 0.00009 | 0.00044 | 0.00027 | 0.00132 |
| Chloroform | 67-66-3 | 119.39 | 0.021 | 93.0% | 1.483E-05 | 0.00007 | 0.00004 | 0.00021 |
| Dichlorobenzene | 50-1, 541-73-1, 106-4 | 147.00 | 1.607 | 93.0% | 0.00140 | 0.00673 | 0.00419 | 0.02020 |
| Dichloromethane (methylenechloride) | 75-09-2 | 84.94 | 3.395 | 93.0% | 0.00171 | 0.00822 | 0.00512 | 0.02466 |
| Ethylbenzene | 100-41-4 | 106.16 | 6.789 | 97.2% | 0.00171 | 0.00822 | 0.00512 | 0.02465 |
| Ethylene dibromide (1,2 Dibromoethane) | 106-93-4 | 187.88 | 0.046 | 93.0% | 5.112E-05 | 2.463E-04 | 0.00015 | 0.00074 |
| Hexane | 110-54-3 | 86.18 | 2.324 | 97.2% | 0.00047 | 0.00228 | 0.00142 | 0.00685 |
| Mercury (total) | 7439-97-6 | 200.61 | 2.920E-04 | 0.0% | 4.950E-06 | 2.385E-05 | 0.00001 | 0.00007 |
| Methyl isobutyl ketone | 108-10-1 | 100.16 | 0.750 | 97.2% | 0.00018 | 0.00086 | 0.00053 | 0.00257 |
| Perchloroethylene (tetrachloroethylene) | 127-18-4 | 165.83 | 1.193 | 93.0% | 0.00117 | 0.00564 | 0.00351 | 0.01692 |
| Toluene | 108-88-3 | 92.13 | 37.456 | 97.2% | 0.00817 | 0.03934 | 0.02450 | 0.11802 |
| Trichloroethylene (trichloroethene) | 79-01-6 | 131.40 | 0.681 | 93.0% | 0.00053 | 0.00255 | 0.00159 | 0.00765 |
| Vinyl chloride | 75-01-4 | 62.50 | 1.077 | 93.0% | 0.00040 | 0.00192 | 0.00119 | 0.00576 |
| Xylenes (mixed isomers) | 1330-20-7 | 106.16 | 16.582 | 97.2% | 0.00417 | 0.02007 | 0.01250 | 0.06020 |
| | | | | **Totals** | 0.02273 | 0.10950 | 0.06818 | 0.32851 |
| | | | | | | | | |
| [5] Hydrochloric Acid (HCl) | 7647-01-0 | 36.45 | 42.000 | 0.0% | 0.12937 | 0.62330 | 0.38811 | 1.86990 |
| | | | | | | | Total HAPs | 2.19841 |

**Engine Operational Calculations [2]**

| | | | | | |
|---|---|---|---|---|---|
| LFG Flowrate | 32,069.71 | cf/hr | 534.50 | cfm | lb/hr basis |
| LFG Flowrate | 35,276.68 | cf/hr | 587.94 | cfm | annual basis |
| $CH_4$ Flowrate | 17,638.34 | cf/hr | 293.97 | cfm | annual basis |

*(calculations are for Nominal fuel consumption per the CAT G3520C Technical Data sheet.)*

**notes:**

1) 379.50 cf/lb-mole @ standard conditions
2) 55% CH4 on lb/hr, 50% CH4 annual basis. Based on engine heat requirement more LFG is required to fuel the engine at the 50% annual CH4 concentration.
3) HAPs concentration in LFG is per WIAC factors. HCl and Mercury are par AP-42 Section 2.4.
4) HCL occurs from combustion of chlorinated compounds per AP-42, Section 2.4.
5) No destruction efficiency is assumed for mercury and HCL
6) Engine destruction efficiency per AP-42, Table 2.4-3.

**Example Calculations:**

*lb/hr basis:*

HCl
Landfill Gas Emissions From Flare = (Molecular Weight Of Compound[lbm/lbmol]) * (Concentration Of Compound[ppmv]) * ( Landfill Gas ToICE [cuft/hr (*55% CH4 basis)* ])
/ (1,000,000 * 379.5 [cuft/lbmole] @ STP)

*Annual basis:*

Vinyl Chloride
Landfill Gas Emissions From Flare = [(Molecular Weight Of Compound[lbm/lbmol]) * (Concentration Of Compound[ppmv]) * ( Landfill Gas To ICE [cuft/hr (*50% CH4 basis)* ])
/ (1,000,000 * 379.5 [cuft/lbmole] @ STP)] * (8,760/2000) * (1 - 93% *destruction efficiency* )

TENNESSEE AIR POLLUTION CONTROL BOARD
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-1531

## Permit to construct or Modify an Air Contaminant Source Issued Pursuant to Tennessee Air Quality Act

Date Issued: JUL 0 1 2010

Permit Number: 963673P

Date Expires: July 1, 2011

Issued To
West Camden Sanitary Landfill

Installation Address:
2410 Highway 70 West
Camden

Installation Description:
02: Addition of Three (3)Caterpillar 3520 Reciprocating Engines (landfill gas-fired)

Emission Source Reference No.:

03-0045-02
Title V Major Source
NSPS (JJJJ),NESHAP(ZZZZ)

The holder of this permit shall comply with the conditions contained in this permit as well as all applicable provisions of the Tennessee Air Pollution Control Regulations.

CONDITIONS:

1. The application that was utilized in the preparation of this permit was dated May 5, 2010 and signed by Charles R. Gillian, Director of Disposal Operations of the permitted facility. If this person terminates employment or is reassigned different duties and is no longer the responsible person to represent and bind the facility in environmental permitting affairs, the owner or operator of this air contaminant source shall notify the Technical Secretary of the change. Said notification shall be in writing and submitted within thirty (30) days of the change. The notification shall include the name and title of the new person assigned by the source owner or operator to represent and bind the facility in environmental permitting affairs. All representations, agreement to terms and conditions, and covenants made by the former responsible person that were used in the establishment of limiting permit conditions on this permit will continue to be binding on the facility until such time that a revision to this permit is obtained that would change said representations, agreements and/or covenants.

**(Continued on the next page)**

Gary R. Stephens
TECHNICAL SECRETARY

No Authority is Granted by this Permit to Operate, Construct, or Maintain any Installation in Violation of any Law, Statute, Code, Ordinance, Rule, or Regulation of the State of Tennessee or any of its Political Subdivisions.

NON TRANSFERABLE

**POST AT INSTALLATION ADDRESS**

2. Should proof of compliance for the pollutant(s) with emission limitations placed on this permit be required, the emissions measuring test method(s) and procedure(s) are the following:

| Pollutant or Parameter | Testing Methodology |
|---|---|
| Carbon Monoxide | EPA Method 10 as published in the current 40 CFR 60, Appendix A |
| Nitrogen Oxide | EPA Method 7,or equivalent,as published in the current 40 CFR 60, Appendix A |
| VOC | EPA Method 25, or equivalent, as published in the current 40 CFR 60, Appendix A |

TAPCR 1200-03-10-.02(1)(a)

3. Visible emissions from each engine shall not exhibit greater than twenty percent (20%) opacity except for one (1) six-minute period per one (1) hour, or more than twenty-four (24) minutes in any twenty-four (24) hour period, as specified in Rules 1200-03-05-.01(1) and 1200-03-05-.03(6) of the Tennessee Air Pollution Control Regulations. Visible emissions shall be determined by EPA Method 9, as outlined in the current 40 CFR 60, Appendix A (six-minute average).

4. Routine maintenance, as required to maintain specified emission limits, shall be performed on the engines. Maintenance records shall be recorded in a suitable permanent form and kept available for inspection by the Division. These records must be retained for a period of not less than two (2) years. TAPCR 1200-03-20-.02(1), 1200-03-10-.02(2)(a).

5. The stated design heat input capacity for this source is 53.6 MM BTU's per hour. If the permittee wishes to increase the capacity of this limits, a construction permit should be applied for in accordance with TAPCR 1200-03-09 of TAPCR.

6. The reciprocating combustion engines will be fired with landfill gas (LFG).

7. Particulate Matter(TSP)emitted from these engines shall not exceed 2.54 pounds per hour (11.12 tons per year). Compliance with this emission limit shall be assured by compliance with Conditions 5 and 6 of this permit. TAPCR 1200-03-06-.02(2).

8. Sulfur Dioxide (SO2) emitted from these engines shall not exceed 8.12 pounds per hour (39.12 tons per year). Compliance with this emission limit shall be assured by compliance with Conditions 5 and 6 of this permit. TAPCR 1200-03-14-.03(5).

9. Carbon Monoxide (CO), nitrogen oxides (NOx), and volatile organic compounds (VOC)emitted from this source shall not exceed the limits specified in Table 2 over the entire life of the engines. Compliance with these emission limits shall be assured by compliance with conditions 5 and 6 of this permit. TAPCR 1200-03-09-.03(8), 40 CFR 60 Subpart JJJJ, TAPCR 1200-03-09-.03(8), 40 CFR §§60.4233(e) and 60.4234.

**Table 2: $NO_X$, CO, and VOC Emission Standards (40 CFR 60 Subpart JJJJ)**

| Engine type and fuel | Maximum engine power | Manufacture date | Emission Standards | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | g/hp-hr | | | ppmvd at 15% $O_2$ | | |
| | | | $NO_X$ | CO | VOC | $NO_X$ | CO | VOC |
| Landfill/Digester Gas(Except Lean burn 500≥HP<1350 | HP≥500 | July 1, 2007 | 3.0 | 5.0 | 1.0 | 220 | 610 | 80 |
| | | July 1, 2010 | 2.0 | 5.0 | 1.0 | 150 | 610 | 80 |

**Note:** The permittee may choose to comply with either emission standard.

(Conditions continued on next page)

10. Carbon monoxide (CO) emitted from these 3 engines shall not exceed 245 tons per year.

11. Pursuant to 40 CFR 60 Subpart JJJJ, the permittee shall comply with the following requirements:

Initial Compliance Tests. Each emissions unit shall be tested to demonstrate initial compliance with the emissions standards for CO, $NO_x$, VOC, VE. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the units. The initial performance tests demonstrating compliance for CO, $NO_x$ and VOC, as required by 40 CFR 60 Subpart JJJJ will satisfy this condition for those pollutants. [40 CFR 60 Subpart JJJJ]

Performance Tests. For each emissions unit, the permittee must conduct an initial performance test within 60 days after achieving permitted capacity, but not later than 180 days after initial startup of the units. Subsequent performance testing shall be conducted every 8,760 hours or 3 years, whichever comes first to demonstrate compliance with emission standards of this permit and requirements of 40 CFR 60 Subpart JJJJ. Performance tests shall be conducted in accordance with the requirements of 40 CFR 60, Subpart JJJJ. Performance tests must be conducted within 10 percent of 100 percent peak (or highest achievable) load and according to the requirements in 40 CFR 60.8 and under the specific conditions that are specified in 40 CFR 60 Subpart JJJJ, Table 2. [40 CFR 60.4244 and 60.4243(b)(2)~~i~~ii)]

Test Requirements. The permittee shall notify the Technical Secretary in writing at least 30 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. [40 CFR 60.8]

Federal Rule Requirements. In addition to the specific conditions listed above, these emissions units are also subject to the applicable requirements contained in 40 CFR 60, Subpart A - General Provisions , 40 CFR 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, and 40 CFR 63, Subpart A - General Provisions and 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines attached to this permit as Appendix NSPS A, and Appendix NSPS JJJJ, Appendix NESHAP A, and Appendix NESHAP ZZZZ, respectively. [Rule 62-213.440, F.A.C.]

Alternative Method of Operation.

a. *Authorized Engine Replacements*. At the time that any of the emissions units need to be replaced, the owner or operator may permanently replace the emissions unit with an engine that shall be the identical make, model, and maximum heat input. All replacement engines shall be owned by Waste Management. All replacement engines shall meet the applicable requirements of 40 CFR 60 Subpart JJJJ and/or 40 CFR 63 Subpart ZZZZ and the conditions of this permit.

b. *Notifications*.

i. At least 15 days prior to installation of the replacement engine the owner or operator shall provide written notification to the Technical Secretary. The notification shall contain the following information:

(Conditions continued on next page)

1. Emission unit number that is being replaced.

2. Replacement engine's information including make, model, year of manufacturer, serial number,

3. maximum engine power, maximum heat input, maximum gas flow, and engine displacement.

4. Date of commencement of installation.

5. Documentation that the engine does or does not meet the definition of *"reconstruction." Reconstruction* is defined as the replacement of components of an affected or a previously non affected source to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source.

6. Applicable requirements and regulations.

7. The notification shall be signed by the facility's responsible official.

ii. The owner or operator shall provide written notification to the Technical Secretary within seven days after placing the replacement engine into operation.

These engines are new 4SLB,stationary reciprocating internal combustion (RICE) engines located at landfill, an area source of HAP emissions. The engines combust landfill or digester gas equivalent to 10% or more of the gross heat input on an annual basis. These engines are subject to and shall comply with the provisions of 40 CFR Part 63, Subpart ZZZZ - *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines* (RICE) (Appendix C) by meeting the requirements of 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for these engines under 40 CFR Part 63, Subpart ZZZZ. [40 CFR Part §63.6580, Subpart ZZZZ, §63.6590(c)]

a. Each performance test must be conducted within 10% of 100% peak (or the highest achievable) load and must comply with the testing requirements listed in 40 CFR §60.8 and under the specific conditions that are specified by Table 2 of Subpart JJJJ of Part 60 - Requirements for Performance Tests;

b. Performance tests may not be conducted during periods of startup, shutdown, or malfunction, as specified in 40 CFR §60.8(c). If the engine is non-operational when a performance test is due, the engine does not need to be started up just to test it, but will need to be tested immediately upon startup;

c. Three separate test runs must be conducted for each engine performance test as specified by §60.8(f). Each test run must be conducted within 10% of 100% peak (or the highest achievable) load and be at least 1 hour in duration;

12. The permittee must submit to the Technical Secretary a copy of the initial and subsequent performance tests within 60 days of the completion of the tests and maintain a copy on-site and make available to Division of Air Pollution Control personnel upon request. [40 CFR 60.4245(d)]

Within 60 days of completion of construction of the LFGTE facility, the permittee must meet the following notification, reporting and recordkeeping requirements for these engines subject to 40 CFR Part 60 Subpart JJJJ. In addition, the permittee shall submit to the Division of Air Pollution Control, maintain on-site and make available to Division of Air Pollution Control personnel upon request, a comprehensive report showing compliance of each engine with NSPS Subpart JJJJ.

Within 60 days of the completion of the tests, the report shall be submitted to the Division of Air Pollution Control at the address listed in condition 14. The notification must include the following information:

a. All notifications submitted to comply with 40 CFR Part 60 Subpart JJJJ and all documentation supporting any notification;
b. Maintenance conducted on each engine;
c. Documentation that each engine meets the emission standard, as listed in Condition #12;
d. Name and address of the permittee;
e. The address of each affected source;
f. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
g. Emission control equipment; and
h. Fuel used.
[40 CFR 60.4245(a)(1,2,4), (c)(1-5) and (d)]

13. The General Provisions of 40 CFR 60 shall apply to this source as indicated in Table 3. TAPCR 1200-03-09-.03(8) and 40 CFR §60.4246.

**Table 3: Applicability of NSPS General Provisions**

| Rule Citation | Requirement | Comments |
|---|---|---|
| §60.1 | General applicability of the General Provisions | |
| §60.2 | Definitions | Additional terms defined in §60.4248. |
| §60.3 | Units and abbreviations | |
| §60.4 | Address | |
| §60.5 | Determination of construction or modification | |
| §60.6 | Review of plans | |
| §60.7 | Notification and Recordkeeping | As specified in §60.4245. |
| §60.8 | Performance tests | Only applies to sources that are subject to performance testing. |
| §60.9 | Availability of information | |
| §60.10 | State Authority | |
| §60.11 | Compliance with standards and maintenance requirements | As specified in subpart JJJJ. |
| §60.12 | Circumvention | |
| §60.14 | Modification | |
| §60.15 | Reconstruction | |
| §60.16 | Priority list | |
| §60.17 | Incorporations by reference | |
| §60.19 | General notification and reporting requirements | |

14. The permittee shall apply for renewal of this permit not less than sixty (60) days prior to the permit expiration date pursuant to Division Rule 1200-.03-9-02(3).

(Conditions continued on next page)

15. The permittee shall certify the start-up date of the air contaminant source regulated by this permit by submitting
A COPY OF ALL PAGES OF THIS PERMIT,
with the information required in A) and B) of this condition completed, to the Technical Secretary's representatives listed below:

A) DATE OF START-UP: _____ / ____ / _____
month day year

B) Anticipated operating rate: ____ percent of maximum rated capacity

For the purpose of complying with this condition, "start-up" of the air contaminant source shall be the date of the setting in operation of the source for the production of product for sale or use as raw materials or steam or heat production.

The undersigned represents that he/she has the full authority to represent and bind the permittee in environmental permitting affairs. The undersigned further represents that the above provided information is true to the best of his/her knowledge and belief.

| Signature | | Date |
|---|---|---|
| Signer's name (type or print) | Title | Phone (with area code) |

Note: This certification is not an application for an operating permit. At a minimum, the appropriate application form(s) must be submitted requesting an operating permit. The application must be submitted in accordance with the requirements of this permit.

The completed certification shall be delivered to the Compliance Validation Program and the Environmental Field Office at the addresses listed below, no later than thirty (30) days after the air contaminant source is started-up.

Compliance Validation Program
Division of Air Pollution Control
9th Floor, L & C Annex
401 Church Street
Nashville, TN 37243-1531

Jackson Environmental Field Office
Division of Air Pollution Control
1625 Hollywood Drive
Jackson, TN 38401

(End of Conditions)