

AIR QUALITY
MANAGEMENT DISTRICT**STATEMENT OF BASIS
FOR
2nd RENEWAL OF TITLE V FEDERAL OPERATING PERMIT**

APPLICATION NO.:	<u>TV2011-08-01</u>
DATE:	<u>November 15, 2011</u>
REVIEWING ENGINEER:	<u>Felix Trujillo, Jr.</u>

A. FACILITY INFORMATION

FACILITY NAME: 28th Street Landfill
Solid Waste Division
Department of Utilities
City of Sacramento

LOCATION: 20 28th Street
Sacramento, CA

MAILING ADDRESS: 2812 Meadowview Road
Sacramento, CA 95832

RESPONSIBLE OFFICIAL: Marty Hanneman, Director
Department of Utilities
City of Sacramento
(916) 808-7508

CONTACT PERSON: John Olesen, Senior Landfill Engineering Technician
Solid Waste Division
Department of Utilities
City of Sacramento
(916) 264-7132

B. PURPOSE OF THIS STATEMENT OF BASIS

The Title V Federal Operating Permit is intended to be a document containing only enforceable terms and conditions as well as any additional information, such as the identification of emission units, emission points, emission sources and processes that makes the terms meaningful. 40 CFR Part 70.7(a)(5) requires that each Title V permit have an accompanying "...statement that sets forth the legal and factual basis for the draft permit conditions". The purpose of this Statement of Basis is to satisfy the above requirement by providing pertinent details regarding the permit/application data and permit conditions in a more easily understandable format. This report will also include background narrative and explanations of regulatory decisions made by the reviewer. It should be emphasized that this Statement of Basis, while based on information contained in the permit, is a separate document and is not itself an enforceable term and condition of the permit.

C. PERMIT HISTORY

This Statement of Basis is for the second renewal of the initial Title V Federal Operating Permit issued to 28th Street Landfill, City of Sacramento on March 27, 2002. The current Title V Federal Operating Permit has a March 27, 2012 expiration date. The following permit actions have occurred since the initial Federal Operating Permit was issued:

<u>Permit Action</u>	<u>Date</u>	<u>Permit No.</u>
Initial Permit	03-27-2002	TV1996-08-01
1st Minor Modification	02-03-2004	TV1996-08-02
1st Permit Renewal	03-27-2007	TV2006-08-01
1st Administrative Amendment	10-05-2010	TV-2006-08-01A

This 2nd permit renewal will be assigned the following permit number: TV2011-08-01.

D. FACILITY DESCRIPTION

The City of Sacramento's 28th Street Landfill is an inactive municipal solid waste landfill located at 28th and A streets in the City of Sacramento. The site is operated by the City of Sacramento Department of Utilities, Solid Waste Division. The landfill footprint, which is comprised of Waste Management Unit A (WMU-A) and Waste Management Unit B (WMU-B), is approximately 107 acres. The 28th Street Landfill began accepting waste into WMU-A in 1968 and completed filling WMU-A in 1986. The 28th Street Landfill began accepting waste into WMU-B in 1986 and completed filling WMU-B in 1994. The landfill stopped receiving waste in September 1994.

Decomposing waste encapsulated within the landfill produces a gas by-product that is primarily composed of methane, carbon dioxide and non-methane organic compounds (NMOC). Landfill gas (LFG) is primarily emitted through two sources. LFG can be emitted as fugitive gas through cover soils or through a landfill gas collection system.

Fortistar operates the landfill gas collection system that serves WMU-A and WMU-B under a contract with the City of Sacramento. The collected landfill gas from WMU-A and WMU-B is sent to Blue Diamond Almond Growers as fuel for their boiler and/or to one of two landfill gas flares on the landfill site for destruction.

The City of Sacramento operates the landfill gas collection system that serves the landfill's perimeter wells. The collected landfill gas from the perimeter wells is also sent to Blue Diamond Almond Growers as fuel for their boiler and/or to one of two landfill gas flares on the landfill site for destruction.

There are two landfill gas flares at the 28th Street Landfill. The first was constructed in 1990 and the second in 1997. Each flare is used and the other serves as a back-up on an as-needed basis. The 1990 landfill gas flare and the 1997 landfill gas flare do not operate at the same time. Each flare is capable of operating 24 hours/day and 365 days/year.

D. SIGNIFICANT EMISSIONS UNIT INFORMATION
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LANDFILL AND LANDFILL GAS COLLECTION SYSTEM

SMAQMD P/O No. 12762(Rev01)

The landfill is equipped with a gas collection system consisting of perimeter wells and interior wells. Vacuum is drawn through the wells via a centrifugal blower. The blower moves the collected landfill gas to the flare or Blue Diamond Almond Grower's boiler.

LANDFILL GAS FLARE 1990

SMAQMD P/O No. 9314(Rev01)

The flare is designed to meet a non-methane organic compound destruction efficiency of 98% while operating at approximately 1475 degrees F with a residence time of 0.6 seconds.

John Zink, Model No. ZTOF, 1,500 scfm, 41 MMBTU/hr (at 455 BTU/cubic foot of landfill gas)

LANDFILL GAS FLARE 1997

SMAQMD P/O No. 14749(Rev01)

The flare is designed to meet a non-methane organic compound destruction efficiency of 98% while operating at approximately 1525 degrees F with a residence time of 0.6 seconds.

John Zink, Model No. ZTOF, 2,000 scfm, 54.6 MMBTU/hr (at 455 BTU/cubic foot of landfill gas)

F. INSIGNIFICANT EMISSIONS UNIT INFORMATION

Equipment Description	Basis for Determination of Insignificant Emissions Unit is made based on SMAQMD "List and Criteria", Part B, Section 5 modified April 2001.
Vehicles used to transport passengers or freight	I. General criteria for insignificant activities. a. Not subject to a preconstruction permit.
Small internal combustion engines used for welders, compressors and generators.	II.B.2 Any piston-type IC engine with a manufacturer's maximum continuous rating of no more than 50 bhp.
Storage containers for liquefied or compressed gases	II.J Any equipment used exclusively for the storage of liquefied gases in unvented (except for emergency pressure-relief valves) pressure vessels.
Storage containers for diesel fuel, compressor oil or lubricants with a vapor pressure of 0.1 psia or less	II.H.1 Any equipment used exclusively for the storage of unheated organic material with: a. An initial boiling point of 302 degrees F or greater; or b. A vapor pressure of no more than 0.1 psia.
Storage containers for diesel fuel, compressor oil or lubricants with a vapor pressure of 1.5 psia or less and a storage capacity of 6076 gallons or less	II.H.3 Any equipment with a capacity of no more than 6,077 gallons used for the storage of unheated organic liquids with a vapor pressure of no more than 1.5 psia.

G. ALTERNATE OPERATING SCENARIOS

None requested by the permittee.

H. RECENT PERMIT ACTIONS

There have been no recent permit actions since the last update to the Title V permit under TV-2006-08-01A.

I. FACILITY EMISSIONS

Equipment	Maximum Potential to Emit tons per year							
	ROC	NOx	PM10	SO2	CO	Single HAP	Total HAPs	GHG
Landfill and Landfill Gas Collection System	3.2 (A)	0	0	0	0	0.03	0.17	--
Flare 1990 (B)	1.8	15	10	1.4	90	1.50	1.54	--
Flare 1997 (B)	1.8	15	13	1.8	48	1.50	1.54	--
Total	5	15	13	2	90	1.53 (C)	1.71 (C)	3,537.1 (D)

- (A) Based on worst case landfill gas concentration of 822 ppm NMOC in uncollected fugitive landfill gas, 2,353 scfm total landfill gas produced, 24 hours/day, 365 days/year and an 85% collection efficiency for landfill gas by the landfill gas collection system.
- (B) The flares do not operate simultaneously. Emissions from each flare are based on operating at maximum capacity, 24 hours/day and 365 days/year. Therefore emissions from the 1990 flare and 1997 flare are not additive to total emissions. The larger emission of the two flares was added to the total emissions.
- (C) Based on documentation in the initial Title V application.
- (D) Based on permittee's 2010 GHG emissions inventory report submitted to U.S. EPA (3,208.8 metric tons/year). Does not include biogenic CO2 emissions.

J. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
1. Facility-wide Requirements

SMAQMD Rule 201 - General Permit Requirements

SIP approved: 07-13-1987 (52 FR 26148)
11-20-1984 rule version SIP approved
08-24-2006 rule version is the current version and is not SIP approved

Rule Description: This rule provides an orderly procedure for the review of new sources of air pollution and of the modification and operation of existing sources through the issuance of permits.

Compliance Status: The permittee has active permits for all sources that require permits.

SMAQMD Rule 202 - New Source Review

SIP approved: SIP approval of 11-20-1984 rule version was withdrawn on 8-19-2011
10-28-2010 rule version is the current version and is not SIP approved.
This Rule is not Federally enforceable

Rule Description: This rule sets the procedures for review of new and modified stationary sources and provides the mechanisms for evaluating the applicability of BACT and/or offset requirements.

Compliance Status: New and modified stationary sources at the permittee's facility have been reviewed pursuant to this rule. BACT and/or emission offsets have been provided as required by the rule.

SMAQMD Rule 207 - Title V Federal Operating Permits

SIP approved: 11-21-2003 (68 FR 65637) (part of Title V program approval)
04-26-2001 rule version is SIP approved

Rule Description: This rule sets forth the procedures for review, issuance and renewal of Title V operating permits.

Compliance Status: The permittee has submitted a timely and complete Title V application for permit renewal in this current permitting action and is currently operating under an active Title V permit.

SMAQMD Rule 214 - Federal New Source Review

SIP approved: 07-20-2011 (76 FR 43183)

Rule Description: This rule sets the procedures for review of emissions units at new and modified major stationary sources and provides the mechanisms for

J. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Facility-wide Requirements

evaluating the applicability of BACT and/or offset requirements.

Compliance Status: This is a recently adopted and SIP approved rule. The facility's equipment will be reviewed pursuant to this rule for all future permitting actions.

SMAQMD Rule 301 – Permit Fees – Stationary Source

SIP approved: Rule adopted 10-27-2005
Latest rule revision 08-01-08

The rule is not SIP approved but the portions of the rule related to Title V permit fees are applicable because they are part of the SMAQMD Title V Federal Operating Permit program approved by U.S. EPA on 11-21-2003 (68 FR 65637).

Rule Description: This rule requires the facility to pay fees associated with the issuance and renewal of Title V permits.

Compliance Status: The permittee has paid permit fees as required and is in compliance.

SMAQMD Rule 401 - Ringelmann Chart

SIP approved: 02-01-1984 (49 FR 3987)
04-19-1983 rule version is SIP approved

Rule Description: This rule limits the discharge of air contaminants into the atmosphere by limiting visible emissions.

Compliance Status: All equipment at the permittee's facility is expected to comply with the visible emissions requirement.

SMAQMD Rule 403 - Fugitive Dust

SIP approved: 12-05-1984 (49 FR 47490):
08-03-1977 rule version is SIP approved

Rule Description: This rule regulates operations which may cause fugitive dust emissions into the atmosphere.

Compliance Status: The permittee's facility complies with this rule by taking the necessary precautions to ensure that fugitive dust is not airborne beyond the property line.

J. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
1. Facility-wide Requirements

SMAQMD Rule 442 - Architectural Coatings

SIP approved: 11-09-1998 (63 FR 60214)
09-05-1996 rule version is SIP approved
05-24-2001 rule version is the current version and is not SIP approved

Rule Description: This rule limits the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application or manufactured for use within the SMAQMD.

Compliance Status: The affected coatings used by the permittee are received and stored in containers that display the required manufacturer's labels and demonstrate compliance with the rule's requirements.

SMAQMD Rule 466 - Solvent Cleaning

SIP approved: 05-05-2010 (75 FR 24406)
10-28-2010 rule version is SIP approved

Rule Description: This rule reduces the emissions of volatile organic compounds from solvent cleaning operations and activities, and from the storage and disposal of new and spent cleaning solvents.

Compliance Status: The affected architectural coating application equipment solvent cleaning materials used by the facility are received and stored in containers that display the required manufacturer's labels and demonstrate compliance with the rule's requirements.

40 CFR 68 (begin at 68.1) - Chemical Accident Prevention Provisions

Promulgated: 01-31-1994 (59 FR 4493)
[04-09-2004 (69 FR 18831) most recent amendment]

Rule Description: This regulation specifies requirements for owners or operators of stationary sources concerning the prevention of accidental chemical releases.

An owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process, as determined under 40 CFR 68.115, must comply with the requirements of 40 CFR Part 68.

40 CFR 68.215 requires that the air permitting authority include in the Title V permit for a facility specified statements regarding the regulation. Those statements are included in the Federally Enforceable Requirements - General section of the permit.

J. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS
1. Facility-wide Requirements

Compliance Status: The permittee does not store regulated substances in quantities exceeding the thresholds specified in 40 CFR 68 and is in compliance with the requirements of the regulation.

40 CFR 82 Subpart F (begin at 82.150) - Protection of Stratospheric Ozone - Recycling and Emissions Reduction:

Promulgated: 05-14-1993 (58 FR 28712)
[04-13-2005 (70 FR 19278) most recent amendment]

Rule Description: The purpose of this subpart is to reduce emissions of class I and class II refrigerants and their substitutes to the lowest achievable level by maximizing the recapture and recycling of such refrigerants during the service, maintenance, repair and disposal of appliances and restricting the sale of refrigerants consisting in whole or in part of a class I and class II ODS in accordance with Title VI of the Clean Air Act.

This subpart applies to any person servicing, maintaining or repairing appliances. This subpart also applies to persons disposing of appliances, including small appliances and motor vehicle air conditioners. In addition, this subpart applies to refrigerant reclaimers, technician certifying programs, appliance owners and operators, manufacturers of appliances, manufacturers of recycling and recovery equipment, approved recycling and recovery equipment testing organizations, persons selling class I or class II refrigerants or offering class I or class II refrigerants for sale and persons purchasing class I or class II refrigerants.

As indicated in 40 CFR 70.6, Title V permits need to assure compliance with all applicable requirements at the time of permit issuance. Part 70 defines as an applicable requirement, "Any standard or other requirement of the regulations promulgated to protect stratospheric ozone under Title VI of the Act, unless the Administrator has determined that such requirements need not be contained in a Title V permit." [40 CFR 70.2(12)]. The applicable requirements of Title VI are included in the Federally Enforceable Requirements - General section of the permit.

Compliance Status: The permittee employs qualified contractors to maintain equipment that contains class I or class II refrigerants.

J. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements

a. Combustion Sources Only

(2) Flares, LFG

SMAQMD Rule 406 - Specific Contaminants

SIP approved: 12-05-84 (49 FR 47490)
12-06-1978 rule version is SIP approved

Rule Description: This rule regulates emissions of sulfur compounds and combustion contaminants by limiting emission concentrations. The rule limits the emission of sulfur compounds, calculated as SO₂ to 0.2% by volume. The rule limits particulate matter to 0.1 grains/dscf at 12% CO₂.

Compliance Status: The emissions from the two flares at the 28th Street Landfill comply with the requirements of the rule (see Attachment C for compliance demonstration).

SMAQMD Rule 420 - Sulfur Content of Fuels

SIP approved: 12-05-1984 (49 FR 47490);
08-13-1981 rule version is SIP approved

Rule Description: This rule regulates emissions of sulfur compounds from combustion of fuels. This rule limits the sulfur content of gaseous fuels to less than 50 grains per 100 cubic feet and the sulfur content of liquid fuels to less than 0.5 percent by weight.

Compliance Status: The landfill gas from the 28th Street Landfill has a sulfur content (as hydrogen sulfide) of approximately 2 grains per 100 cubic feet and complies with the requirements of the rule.

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

b. Landfill and Landfill Gas Collection System

40 CFR 60 Subpart WWW (begin at 60.750) - Standards of Performance for Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR 9919)

Rule Description: Subpart WWW limits emissions of NMOC from municipal solid waste landfills with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and with NMOC emissions greater than 50 megagrams/year where construction, reconstruction or modification was commenced on or after May 30, 1991.

There was a modification at the 28th Street Landfill (as defined in 40 CFR 60.751) on or after May 30, 1991. The volume design capacity of the landfill was increased by the modification of the permit issued by the California Regional Water Quality Control Board, Central Valley Region, dated September 25, 1995. Therefore 40 CFR 60 Subpart WWW and not Subpart Cc (Emission Guidelines) applies to the Landfill and Landfill Gas Collection System.

Subpart WWW requirements for the Landfill and Landfill Gas Collection System include:

1. Collection of landfill gas by the use of wells in the landfill.
2. The wells must collect the landfill gas at a rate that does not allow methane concentration at the surface of the landfill to exceed 500 ppmv above background.
3. The collected landfill gas must be directed to an air pollution control device or landfill gas treatment system.
4. Wells must be monitored monthly for temperature and oxygen concentration.
5. The surface of the landfill must be monitored quarterly for methane, except that closed landfills may monitor yearly under certain circumstances.
6. Recordkeeping for operational parameters.
7. Reporting of monitored data and exceedances of operating parameters.

Compliance Status: The Landfill and Landfill Gas Collection System is currently in compliance with the requirements of 40 CFR 60 Subpart WWW.

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

b. Landfill and Landfill Gas Collection System

The following SMAQMD rule is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

SMAQMD Rule 485 - Municipal Landfill Gas

SIP approved: Rule 485 was approved September 23, 1999 (64 FR 51447), with an effective date of November 22, 1999, as part of the California State Plan for implementing the Emission Guidelines (40 CFR 60 Subpart Cc) applicable to existing municipal solid waste landfills (also known as a Federal Clean Air Act 111(d) plan).

Rule Description: This rule limits emissions of NMOC from municipal solid waste landfills with NMOC emissions greater than 50 megagrams/year. The rule requirements incorporate the requirements of the Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills 40 CFR 60 Subpart Cc.

SMAQMD Rule 485 Section 110 provides an exemption from the requirements of the rule for "any MSW landfill that is subject to the requirements of the New Source Performance Standard Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills (40 CFR 60.750)...".

Compliance Status: The 28th Street Landfill and Landfill Gas Collection System is subject to 40 CFR 60 Subpart WWW and is therefore exempt from SMAQMD Rule 485.

The following federal regulation is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

40 CFR 60 Subpart Cc (begin at 60.30c) - Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR 9919)

Rule Description: Subpart Cc limits emissions of NMOC from existing municipal solid waste landfills with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and with NMOC emissions greater than 50 megagrams/year where **no** construction, reconstruction or modification was commenced on or after May 30, 1991.

Compliance Status: There has been a modification at the 28th Street Landfill (as defined in 40 CFR 60.751) on or after May 30, 1991. The volume design capacity of the landfill was increased by the modification of the permit issued by the California Regional Water Quality Control Board, Central Valley Region, dated September 25, 1995. Therefore Subpart Cc does not apply to the

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

b. Landfill and Landfill Gas Collection System

Landfill and Landfill Gas Collection System.

The following federal regulation is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

40 CFR 64 (begin at 64.1) Compliance Assurance Monitoring:

Promulgated: 10-22-1997 (52 FR 54940)

Rule Description: The Compliance Assurance Monitoring regulation applies to pollutant-specific emissions units at a major source if the unit satisfies all of the following criteria:

“The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;”
[40 CFR 64.2(a)(1)]

“The unit uses a control device to achieve compliance with any such emission limitation or standard; and”
[40 CFR 64.2(a)(2)]

“The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount to be classified as a major source. For purposes of this paragraph, “potential pre-control device emissions” shall have the same meaning as “potential to emit,” as defined in §64.1, except that emission reductions achieved by the applicable control device shall not be taken into account.”
[40 CFR 64.2(a)(3)]

Section 64.2(b)(i) states that the requirements of this part shall not apply to any emission limitations or standards proposed after November 15, 1990 pursuant to section 111 or 112 of the Act. Emission limitation or standard means any applicable requirements that constitute an emission limitation, emission standard, standard of performance or means of emission limitation under the Act.

Compliance Status: The landfill is subject to 40 CFR Subpart WWW, which was promulgated in 1996. Therefore, the landfill is exempt from 40 CFR Part 64.

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

b. Landfill and Landfill Gas Collection System

SMAQMD Permit to Operate No. 12762(Rev01):

Permit Conditions No. 1 and No. 3 are not federally enforceable. All other conditions of the permit are federally enforceable since they are requirements of SIP approved rules and/or federal NSPS and NESHAP regulations. The Landfill and Landfill Gas Collection System is currently in compliance with all the conditions of SMAQMD Permit to Operate No. 12762(Rev01).

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

**1. Equipment Specific Requirements:
c. Landfill Gas Flare (1990)**

40 CFR 60 Subpart WWW (begin at 60.750) - Standards of Performance for Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR 9919)

Rule Description: Subpart WWW limits emissions of NMOC from municipal solid waste landfills with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and with NMOC emissions greater than 50 megagrams/year where construction, reconstruction or modification was commenced on or after May 30, 1991.

There was a modification at the 28th Street Landfill (as defined in 40 CFR 60.751) on or after May 30, 1991. The volume design capacity of the landfill was increased by the modification of the permit issued by the California Regional Water Quality Control Board, Central Valley Region, dated September 25, 1995. Therefore 40 CFR 60 Subpart WWW and not Subpart Cc (Emission Guidelines) applies to the Landfill and Landfill Gas Collection System.

40 CFR 60 Subpart WWW requirements for the Landfill Gas Flare (1990) include:

1. Landfill gas destruction must be 98% or greater or emissions must be less than 20 ppmvd as hexane at 3% O₂.
2. A temperature monitoring device at a specific location in the flare exhaust and operation of the flare at a minimum temperature determined by source testing.
3. Recordkeeping for operational parameters.
4. Reporting of monitored data and exceedances of operating parameters.

Compliance Status: The Landfill gas Flare (1990) is currently in compliance with the requirements of 40 CFR 60 Subpart WWW.

40 CFR 63 Subpart AAAA (begin at 63.1930) - National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR9919)

Rule Description: 40 CFR 63 Subpart AAAA limits emissions of hazardous air pollutants (HAP) from municipal solid waste landfills that are a major source of HAP (i.e. greater than 10 tons/year of a single HAP or greater than 25 tons/year of total HAP).

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

**1. Equipment Specific Requirements:
c. Landfill Gas Flare (1990)**

40 CFR 63 Subpart AAAA requirements for the Landfill Gas Flare (1990) are the same as 40 CFR 60 Subpart WWW requirements but also include:

1. The development of a Startup, Shutdown and Malfunction (SSM) Plan.
2. Taking actions specified in the SSM Plan when applicable.
3. Recordkeeping related to the SSM Plan.
4. Reporting related to the SSM Plan.

Compliance Status: The Landfill Gas Flare (1990) is currently in compliance with the requirements of 40 CFR 63 Subpart AAAA.

The following SMAQMD rule is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

SMAQMD Rule 485 - Municipal Landfill Gas

SIP approved: Rule 485 was approved September 23, 1999 (64 FR 51447), with an effective date of November 22, 1999, as part of the California State Plan for implementing the Emission Guidelines (40 CFR 60 Subpart Cc) applicable to existing municipal solid waste landfills (also known as a Federal Clean Air Act 111(d) plan).

Rule Description: This rule limits emissions of NMOC from municipal solid waste landfills with NMOC emissions greater than 50 megagrams/year. The rule requirements incorporate the requirements of the Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills 40 CFR 60 Subpart Cc.

SMAQMD Rule 485 Section 110 provides an exemption from the requirements of the rule for "any MSW landfill that is subject to the requirements of the New Source Performance Standard Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills (40 CFR 60.750)...".

Compliance Status: The Landfill Gas Flare (1990) is subject to 40 CFR 60 Subpart WWW and is therefore exempt from SMAQMD Rule 485.

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

**1. Equipment Specific Requirements:
c. Landfill Gas Flare (1990)**

The following federal regulation is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

40 CFR 60 Subpart Cc (begin at 60.30c) - Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR 9919)

Rule Description: Subpart Cc limits emissions of NMOC from existing municipal solid waste landfills with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and with NMOC emissions greater than 50 megagrams/year where **no** construction, reconstruction or modification was commenced on or after May 30, 1991.

Compliance Status: There has been a modification at the 28th Street Landfill (as defined in 40 CFR 60.751) on or after May 30, 1991. The volume design capacity of the landfill was increased by the modification of the permit issued by the California Regional Water Quality Control Board, Central Valley Region, dated September 25, 1995. Therefore Subpart Cc does not apply to the Landfill Gas Flare (1990).

The following federal regulation is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

40 CFR 64 (begin at 64.1) Compliance Assurance Monitoring:

Promulgated: 10-22-1997 (52 FR 54940)

Rule Description: The Compliance Assurance Monitoring regulation applies to pollutant-specific emissions units at a major source if the unit satisfies all of the following criteria:

"The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;"
[40 CFR 64.2(a)(1)]

"The unit uses a control device to achieve compliance with any such emission limitation or standard; and"
[40 CFR 64.2(a)(2)]

"The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount to be classified as a major

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

c. Landfill Gas Flare (1990)

source. For purposes of this paragraph, "potential pre-control device emissions" shall have the same meaning as "potential to emit," as defined in §64.1, except that emission reductions achieved by the applicable control device shall not be taken into account."

[40 CFR 64.2(a)(3)]

Section 64.2(b)(i) states that the requirements of this part shall not apply to any emission limitations or standards proposed after November 15, 1990 pursuant to section 111 or 112 of the Act. Emission limitation or standard means any applicable requirements that constitute an emission limitation, emission standard, standard of performance or means of emission limitation under the Act.

Compliance Status: The flare is subject to 40 CFR Subpart WWW, which was promulgated in 1996. Therefore, the flare is exempt from 40 CFR Part 64.

SMAQMD Permit to Operate No. 9314(Rev01):

Permit Conditions No. 1 and No. 3 are not federally enforceable. All other conditions of the permit are federally enforceable since they are requirements of SIP approved rules and/or federal NSPS and NESHAP. The Landfill Gas Flare (1990) is currently in compliance with all the conditions of SMAQMD Permit to Operate No. 9314(Rev01).

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

d. Landfill Gas Flare (1997)

40 CFR 60 Subpart WWW (begin at 60.750) - Standards of Performance for Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR 9919)

Rule Description: Subpart WWW limits emissions of NMOC from municipal solid waste landfills with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and with NMOC emissions greater than 50 megagrams/year where construction, reconstruction or modification was commenced on or after May 30, 1991.

There was a modification at the 28th Street Landfill (as defined in 40 CFR 60.751) on or after May 30, 1991. The volume design capacity of the landfill was increased by the modification of the permit issued by the California Regional Water Quality Control Board, Central Valley Region, dated September 25, 1995. Therefore 40 CFR 60 Subpart WWW and not Subpart Cc (Emission Guidelines) applies to the Landfill and Landfill Gas Collection System.

40 CFR 60 Subpart WWW requirements for the Landfill Gas Flare (1990) include:

1. Landfill gas destruction must be 98% or greater or emissions must be less than 20 ppmvd as hexane at 3% O₂.
2. A temperature monitoring device at a specific location in the flare exhaust and operation of the flare at a minimum temperature determined by source testing.
3. Recordkeeping for operational parameters.
4. Reporting of monitored data and exceedances of operating parameters.

Compliance Status: The Landfill gas Flare (1997) is currently in compliance with the requirements of 40 CFR 60 Subpart WWW.

40 CFR 63 Subpart AAAA (begin at 63.1930) - National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR9919)

Rule Description: 40 CFR 63 Subpart AAAA limits emissions of hazardous air pollutants (HAP) from municipal solid waste landfills that are a major source of HAP (i.e. greater than 10 tons/year of a single HAP or greater than 25 tons/year of total HAP).

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

d. Landfill Gas Flare (1997)

40 CFR 63 Subpart AAAAA requirements for the Landfill Gas Flare (1997) are the same as 40 CFR 60 Subpart WWW requirements but also include:

1. The development of a Startup, Shutdown and Malfunction (SSM) Plan.
2. Taking actions specified in the SSM Plan when applicable.
3. Recordkeeping related to the SSM Plan.
4. Reporting related to the SSM Plan.

Compliance Status: The Landfill Gas Flare (1997) is currently in compliance with the requirements of 40 CFR 63 Subpart AAAAA.

The following SMAQMD rule is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

SMAQMD Rule 485 - Municipal Landfill Gas

SIP approved: Rule 485 was approved September 23, 1999 (64 FR 51447), with an effective date of November 22, 1999, as part of the California State Plan for implementing the Emission Guidelines (40 CFR 60 Subpart Cc) applicable to existing municipal solid waste landfills (also known as a Federal Clean Air Act 111(d) plan).

Rule Description: This rule limits emissions of NMOC from municipal solid waste landfills with NMOC emissions greater than 50 megagrams/year. The rule requirements incorporate the requirements of the Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills 40 CFR 60 Subpart Cc.

SMAQMD Rule 485 Section 110 provides an exemption from the requirements of the rule for "any MSW landfill that is subject to the requirements of the New Source Performance Standard Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills (40 CFR 60.750)...".

Compliance Status: The Landfill Gas Flare (1997) is subject to 40 CFR 60 Subpart WWW and is therefore exempt from SMAQMD Rule 485.

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

**1. Equipment Specific Requirements:
d. Landfill Gas Flare (1997)**

The following federal regulation is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

40 CFR 60 Subpart Cc (begin at 60.30c) - Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills:

Promulgated: 03-12-1996 (61 FR 9919)

Rule Description: Subpart Cc limits emissions of NMOC from existing municipal solid waste landfills with a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters and with NMOC emissions greater than 50 megagrams/year where **no** construction, reconstruction or modification was commenced on or after May 30, 1991.

Compliance Status: There has been a modification at the 28th Street Landfill (as defined in 40 CFR 60.751) on or after May 30, 1991. The volume design capacity of the landfill was increased by the modification of the permit issued by the California Regional Water Quality Control Board, Central Valley Region, dated September 25, 1995. Therefore Subpart Cc does not apply to the Landfill Gas Flare (1997).

The following federal regulation is not an applicable federal requirement but is discussed here to document the non-applicability determination for the record:

40 CFR 64 (begin at 64.1) Compliance Assurance Monitoring:

Promulgated: 10-22-1997 (52 FR 54940)

Rule Description: The Compliance Assurance Monitoring regulation applies to pollutant-specific emissions units at a major source if the unit satisfies all of the following criteria:

"The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1) of this section;"
[40 CFR 64.2(a)(1)]

"The unit uses a control device to achieve compliance with any such emission limitation or standard; and"
[40 CFR 64.2(a)(2)]

"The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount to be classified as a major

K. APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

1. Equipment Specific Requirements:

d. Landfill Gas Flare (1997)

source. For purposes of this paragraph, "potential pre-control device emissions" shall have the same meaning as "potential to emit," as defined in §64.1, except that emission reductions achieved by the applicable control device shall not be taken into account."

[40 CFR 64.2(a)(3)]

Section 64.2(b)(i) states that the requirements of this part shall not apply to any emission limitations or standards proposed after November 15, 1990 pursuant to section 111 or 112 of the Act. Emission limitation or standard means any applicable requirements that constitute an emission limitation, emission standard, standard of performance or means of emission limitation under the Act.

Compliance Status: The flare is subject to 40 CFR Subpart WWW, which was promulgated in 1996. Therefore, the flare is exempt from 40 CFR Part 64.

SMAQMD Permit to Operate No. 14749(Rev01):

Permit Conditions No. 1 and No. 3 are not federally enforceable. All other conditions of the permit are federally enforceable since they are requirements of SIP approved rules and/or federal NSPS and NESHAP. The Landfill gas Flare (1997) is currently in compliance with all the conditions of SMAQMD Permit to Operate No. 14749(Rev01).

L. PERMIT SHIELD

PERMIT SHIELD

None requested by the applicant.

M. TITLE V PERMIT RENEWAL AND PERMIT CONDITIONS

TITLE V PERMIT CONDITIONS:

It is recommended that the 28th Street Landfill, City of Sacramento Title V Federal Operating Permit be renewed.

See proposed Title V Federal Operating Permit No. TV2011-08-01 for permit conditions.

Approved by: _____

A handwritten signature in black ink, appearing to read "George H. ...", written over a horizontal line.

Date: _____

1/10/12

ATTACHMENT A

SMAQMD RULES THAT ARE

"APPLICABLE FEDERALLY

ENFORCEABLE REQUIREMENTS"

FOR THE 28TH STREET LANDFILL

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●	●	101	General Provisions and Definitions 09/03/1998 adoption	Yes - no related conditions are included in the permit because of general nature of the rule.
●	●	102	Circumvention 11/29/1983 adoption	Yes - no related conditions are included in the permit because of general nature of the rule.
●	●	103	Exceptions 11/29/1983 adoption	No - source does not operate the type of equipment described in this rule.
●	●	104	General Conformity 11/03/1994 adoption	No - the rule's purpose is to have the SMAQMD review federal conformity findings.
●	●	105	Emission Statement 04/20/1993 adoption	No - actual facility emissions of ROC and NOx are less than 25 tons/year.
●		107	Alternative Compliance	No - it is not a SIP approved rule.
●		108	Minor Violations	No - it is not a SIP approved rule.
●	●	201	General Permit Requirements 11/20/1984 adoption	Yes - no related conditions are included in the permit because of the general nature of the rule.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●		202	New Source Review	No - SIP approved 11-20-1984 version was withdrawn 08-19-2011. Current version 10-28-2010 is not SIP approved.
●		203	Prevention of Significant Deterioration 01-27-2011 Adoption	Yes - rule became effective 08-19-2011. Projects processed after the effective date shall be evaluated under this rule.
		204	Emission Reduction Credits	No - it is not a SIP approved rule.
		205	Community Bank and Priority Reserve Bank	No - it is not a SIP approved rule.
		206	Mobile and Transportation Source Emission Reduction Credits	No - it is not a SIP approved rule.
●	*	207	Title V Federal Operating Permit Program	Yes - related conditions are included in the permit. (*Although this is not a SIP approved rule it is applicable because it is part of the approved Title V Permit Program.)
		208	Acid Rain	No - it is not a SIP approved rule.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●		209	Limiting Potential to Emit	No - it is not a SIP approved rule.
		210	Synthetic Minor Source Status	No - it is not a SIP approved rule.
		211	MACT at Major Sources of Hazardous Air Pollutants	No - it is not a SIP approved rule.
●		213	Federal Major Modifications	No - it is not a SIP approved rule.
●	●	214	Federal New Source Review	Yes - rule became effective 08-19-2011. Projects processed after the applicable date shall be evaluated under this rule.
		215	Agricultural Permit Requirements and New Agricultural Permit Review	No - it is not a SIP approved rule.
●	* ●	301	Stationary Source Permit Fees	Yes - related conditions are included in the permit. (*Although this is not a SIP approved rule it is applicable because it is part of the approved Title V Permit Program.)
		302	Hearing Board Fees	No - it is not a SIP approved rule.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●		303	Agricultural Burning Permit Fees	No - it is not a SIP approved rule.
		304	Plan Fees	No - it is not a SIP approved rule.
		305	Environmental Document Preparation and Processing Fees	No - it is not a SIP approved rule.
●		306	Air Toxics Fees	No - it is not a SIP approved rule.
	●	307	Clean Air Act Fees 09/26/2002 adoption	No - the source is not classified as major
		310	Permit Fees - Agricultural Source	No - it is not a SIP approved rule
●	●	401	Ringelmann Chart 04/05/1983 adoption	Yes - related conditions are included in the permit.
●		402	Nuisance	No - it is not a SIP approved rule.
●	●	403	Fugitive Dust 11/29/1983 adoption	Yes - related conditions are included in the permit.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●	●	404	Particulate Matter 11/20/1984 adoption	Yes - related conditions are included in the permit.
●	●	405	Dust and Condensed Fumes 11/29/1983 adoption	No - the source does not operate such a process.
●	●	406	Specific Contaminants 11/29/1983 adoption	Yes - related conditions are included in the permit.
●	●	407	Open Burning 11/29/1983 adoption	Yes - no related conditions are included in the permit.
●	●	408	Incinerator Burning 11/29/1983 adoption	No - the source does not operate an incinerator.
●	●	409	Orchard Heaters 11/29/1983 adoption	No - the source does not operate orchard heaters.
●	●	410	Reduction of Animal Matter 11/29/1983 adoption	No - the source does not operate equipment for the reduction of animal matter.
●	●	411	Boiler NOx 08/23/2007 adoption	No - the source does not operate a boiler subject to this rule.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●	●	412	Stationary IC Engines at Major Stationary Sources of NOx 06/01/1995 adoption	No - the source does not operate an IC engine and is not a major source.
●	●	413	Stationary Gas Turbines 03/24/2005 version	No - the source does not operate a gas turbine.
●	●	414	Natural Gas Fired Water Heaters 08/01/1996 adoption 03/25/2010 rule version is not SIP approved	No - the source does not operate natural gas fired water heaters.
●	●	417	Wood Burning Appliances	No - it is not a SIP approved rule.
●	●	420	Sulfur Content of Fuels 11/29/1983 adoption	Yes - related conditions are included in the permit.
●	●	441	Organic Solvents 11/29/1983 adoption	Yes - no related conditions are included in the permit because of limited applicability.
●	●	442	Architectural Coatings 09/05/1996 adoption	Yes - related conditions are included in the permit.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●	●	443	Leaks from Synthetic Organic Chemical and Polymer Manufacturing 09/05/1996 adoption	No - the source does not operate synthetic organic chemical or polymer manufacturing equipment.
●	●	444	Petroleum Solvent Dry Cleaning 09/05/1996 adoption	No - the source does not operate petroleum solvent dry cleaning equipment.
●	●	446	Storage of Petroleum Products 11/16/1993 adoption	No - the source does not store petroleum products.
●	●	447	Organic Liquid Loading 04/02/1998 adoption	No - the source does not operate organic liquid loading equipment.
●	●	448	Gasoline Transfer into Stationary Storage Containers 02/02/1995 adoption	No - the source does not operate such equipment.
●	●	449	Transfer of Gasoline into Vehicle Fuel Tanks 09/26/2002 adoption	No - the source does not operate such equipment.
●	●	450	Graphic Arts Operations 10/23/2008 adoption	No - the source does not operate a graphic arts process as defined in the rule.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●	●	451	Surface Coating of Miscellaneous Metal Parts and Products 11/29/1983 adoption 10/28/2010 rule version is not SIP approved	Yes - no related conditions are included in the permit because of limited applicability.
●	●	452	Can Coating 09/25/2008 adoption	No - the source does not operate a can coating process.
●	●	453	Cutback and Emulsified Asphalt Paving Materials 11/29/1983 adoption	No - the source does not manufacture or apply cutback or emulsified asphalt paving materials.
●	●	454	Degreasing Operations 09/25/2008 adoption	No - the source does not operate degreasers subject to this rule.
●	●	455	Pharmaceuticals Manufacturing 11/29/1983 adoption	No - the source does not manufacture pharmaceuticals.
●	●	456	Aerospace Coating Operations 09/05/1996 adoption	No - the source does not coat aerospace parts.
●	●	458	Large Commercial Bread Bakeries 09/05/1996 adoption	No - the source does not produce bread products.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●	●	459	Automotive, Truck and Heavy Equipment Refinishing Operations 10/02/1997 adoption	No - the source does not refinish vehicles.
●		460	Adhesives and Sealants	No - it is not a SIP approved rule.
●	●	463	Wood Products Coatings 09/25/2008 adoption	No - it is not a SIP approved rule.
●	●	464	Organic Chemical Manufacturing Operations 07/23/1998 adoption	No - the source does not manufacture organic chemicals.
●	●	465	Polyester Resin Operations 09/25/08 adoption	No - it is not a SIP approved rule.
●	●	466	Solvent Cleaning 10/28/2010 adoption	Yes - related conditions are included in the permit.
		485	Municipal Landfill Gas	No - it is not a SIP approved rule.
		496	Large Confined Animal Facilities	No - it is not a SIP approved rule.
●	●	501	Agricultural Burning 11/29/1983 adoption	No - the source does not conduct agricultural burning.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
●		601	Procedure before the Hearing Board	No - it is not a SIP approved rule.
●		602	Breakdown Conditions: Emergency Variance	No - it is not a SIP approved rule.
●	●	701	Emergency Episode Plan 05/27/1999 adoption	Yes - at this time the source emissions are below the rule's applicability level.
		801	New Source Performance Standards	No - it is not a SIP approved rule. Note: there are equivalent federal regulations.
		901	General Requirements	No - it is not a SIP approved rule. Note: there are equivalent federal regulations.
		902	Asbestos	No - it is not a SIP approved rule. Note: there is an equivalent federal regulation.
		903	Mercury	No - it is not a SIP approved rule. Note: there is an equivalent federal regulation.
		904	Airborne Toxic Control Measures	No - it is not a SIP approved rule. Note: there are equivalent federal regulations for some of the listed ATCMs.

**SMAQMD RULES THAT ARE
 "APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS"
 FOR THE 28TH STREET LANDFILL**

Rule is Applicable	Rule is SIP Approved	Rule No.	Rule Title	Is the Rule an "Applicable Federally Enforceable Requirement"?
		1002	Fleet Inventory	No - it is not a SIP approved rule.
		1003	Reduced-Emission Fleet Vehicles/Alternative Fuels	No - it is not a SIP approved rule.
		1005	Mobile Source Emission Reduction Credits/Banking	No - it is not a SIP approved rule.
		1006	Transportation Conformity	No - it is not a SIP approved rule.

ATTACHMENT B

SMAQMD RULE 201 PERMITS TO OPERATE



PERMIT TO OPERATE

28th Street Landfill
Solid Waste Division
City of Sacramento
2812 Meadowview Road
Sacramento, CA 95832

Equipment Location: 20 28th Street, Sacramento

Permit No.	Equipment Description
9314(Rev01)	Landfill gas flare (1990), John Zink, Model ZTOF, enclosed type, 1,500 cfm capacity, 41 MMBTU/hour at 455 BTU/cf

SUBJECT TO THE FOLLOWING CONDITIONS:

GENERAL REQUIREMENTS

1. The equipment shall be properly maintained.
2. The Air Pollution Control Officer and/or authorized representatives, upon the presentation of credentials, shall be permitted:
 - A. To enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this Permit to Operate, and
 - B. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this Permit to Operate, and
 - C. To inspect any equipment, operation or method required in this Permit to Operate, and
 - D. To sample emissions from the source or require samples to be taken.
3. This Permit to Operate does not authorize the emission of air contaminants in excess of those allowed by Division 26, Part 4, Chapter 3, of the California Health and Safety Code or the rules and regulations of the SMAQMD.

Date Issued: 09-01-1996
Date Revised: 03-12-2007
Date Expires: 09-01-2007 (unless renewed)

Larry Greene
Air Pollution Control Officer

by: Bruce Nixson

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
PERMIT TO OPERATE

4. A legible copy of this Permit to Operate shall be maintained on the premises with the equipment.

EMISSION LIMIT REQUIREMENTS

5. The Landfill Gas Flare (1990) shall not discharge into the atmosphere any visible air contaminants other than uncombined water vapor, for a period or periods aggregating more than three minutes in any one hour, which are as dark or darker than Ringelmann No. 1 or equivalent to or greater than 20% opacity.

6. Emissions from the Landfill Gas Flare (1990) shall not exceed the following:

Pollutant	Maximum Allowable Emissions
ROC	A. 2% of inlet NMOC (equivalent to a 98% NMOC destruction efficiency) or 20 ppmvd at 3% O ₂ measured as hexane, and B. 0.01 lb/MMBTU (high heating value)
NO _x (BACT)	0.0825 lb/MMBTU (high heating value)
CO (BACT)	0.50 lb/MMBTU (high heating value)

7. Emissions from the Landfill Gas Flare (1990) shall not exceed the following:

Pollutant	Emission Factor (A) lb/MMcf	Maximum Allowable Emissions (B)	
		lb/day	lb/quarter
ROC	4.7	10	920
NO _x	37.5	81	7,544
SO _x	3.43	7.4	682
PM ₁₀	32	69	6,348
CO	228	492	45,264

(A) Emission factors for ROC, NO_x and CO are based on permit limits of 0.01 lb/MMBTU, 0.0825 lb/MMBTU and 0.50 lb/MMBTU respectively and a heat content of 455 BTU/scf of landfill gas. Emission factor for SO_x is based on a sulfur content in the landfill gas of 1.3 grains per 100 cf as H₂S and a destruction efficiency of 98%. Emission factor for PM₁₀ is based on an emission rate of 2.9 lb/hr.

(B) Emissions based on 1,500 scfm landfill gas combustion rate, 24 hours/day and 92 days/quarter.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
PERMIT TO OPERATE

EQUIPMENT OPERATION AND MONITORING REQUIREMENTS:

8. The amount of landfill gas combusted by the Landfill Gas Flare (1990) shall not exceed the following limit :

Flare Identifier	Maximum Allowable Landfill Gas Combusted by Landfill Gas Flare (1990) (A) million cubic feet/quarter
Landfill Gas Flare (1990)	199

(A) Based on the flare operating at maximum capacity of 1500 scfm, 24 hours/day and 92 days/quarter.

9. The sulfur content of the landfill gas combusted in the Landfill Gas Flare (1990) shall not exceed 1.3 grains/100 scf as hydrogen sulfide (H₂S).
10. A sampling port, or other method approved by the Air Pollution Control Officer, shall be installed at the inlet gas line to the Landfill Gas Flare (1990). The sampling port shall be located so that an accurate volume flow measurement can be performed.
11. The Landfill Gas Flare (1990) exhaust sample ports shall be permanent, accessible and located and constructed as per applicable U.S. EPA, CARB and U.S. OSHA requirements.
12. The Landfill Gas Flare (1990) shall be equipped with a temperature monitoring device.
- A. The thermocouple used to measure the flare temperature shall be located at a distance that is greater than the distance equivalent to 0.6 seconds at the maximum flow rate downstream of the burner.
 - B. The temperature monitoring device shall be equipped with a continuous recorder.
 - C. The temperature monitoring device shall have an accuracy of ± 1 percent of the temperature being measured expressed in degrees Celsius or ± 0.5 degrees C, whichever is greater.
 - D. The temperature monitoring device is not precluded from expressing measurements in degrees Fahrenheit as long as the aforementioned accuracy is met.
 - E. The owner or operator shall submit to the Air Pollution Control Officer for approval a description of the temperature monitoring device calibration procedure and schedule of calibration.
13. The Landfill Gas Flare (1990) shall operate at a minimum combustion zone temperature equal to the 3-hour average temperature (measured by the thermocouple specified in Condition No. 12) as determined during the most recent complying source test minus 28 degrees C (50 degrees F)
- (The data from the most recent source test is summarized in Attachment A indicating the 3-hour average temperature measured by the thermocouple in Condition No. 12.)
- A. The minimum combustion zone temperature shall not be in effect for a maximum of five days in each calendar year when emissions testing is being performed to determine if the required NMOC destruction efficiency or NMOC exhaust concentration can be met at a lower combustion zone temperature.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
PERMIT TO OPERATE

RECORDKEEPING AND REPORTING REQUIREMENTS:

14. The following record shall be continuously maintained on site for the most recent 5 year period, except as noted, and shall be made available to the Air Pollution Control Officer upon request. Quarterly records shall be made available within 30 days of the end of the reporting period.

Frequency	Information to be recorded
At all times	<p>A. The following information measured during the initial performance test shall be maintained for the life of the Landfill Gas Flare (1990). Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. [40 CFR 60.758(b)]</p> <ul style="list-style-type: none"> i. The average combustion temperature of the Landfill Gas Flare (1990) measured at least every 15 minutes and averaged over the same time period as the performance test. [40 CFR 60.758(b)(2)(i)] ii. The percent reduction of NMOC, determined as specified in 40CFR60.752(b)(2)(iii)(B), achieved by the Landfill Gas Flare (1990). [40 CFR 60.758(b)(2)(ii)] <p>B. All 3 hour periods of operation during which the Landfill Gas Flare (1990) average combustion temperature was below the limit established in Condition No. 13. [40 CFR 60.758(c)(1)(i)]</p> <p>C. All deviations that occur in continuous parameter monitoring data: [40 CFR 63.1960]</p> <ul style="list-style-type: none"> i. Deviation is defined as when 1 hour or more of the hours during the 3 hour block averaging period does not constitute a valid hour of data. [40 CFR 63.1965(b)] ii. A valid hour of data must have measured values for at least three 15 minute monitoring periods within the hour. [40 CFR 63.1965(b)] iii. Continuous parameter monitoring data collected during the following events are not to be included in any 3 hour block average: [40 CFR 63.1975(a) - (d)] <ul style="list-style-type: none"> (a) Monitoring system breakdowns, repairs, calibration checks and zero (low level) and high level adjustments. (b) Startups. (c) Shutdowns. (d) Malfunctions <p>D. Record of calibration reports for the temperature monitoring device.</p>
Quarterly	<p>E. The combined amount of landfill gas consumed in Landfill Gas Flare (1990) and Landfill Gas Flare (1997). (cubic feet/quarter)</p>

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
PERMIT TO OPERATE

15. A written report shall be submitted to the Air Pollution Control Officer annually by the date indicated and shall contain the following information.

Frequency	Information to be submitted
Annually by: February 28 for the previous calendar year	<p>A. All 3-hour periods of operation during which the average Landfill Gas Flare (1990) combustion temperature was more than 50 degrees F (28 degrees C) below the 3-hour average Landfill Gas Flare (1990) combustion temperature during the most recent performance test at which compliance with 40 CFR 60.752(b)(2)(iii) was determined. [40 CFR 60.758(c)(1)(i)]</p> <p>B. All deviations that occur in continuous parameter monitoring data. [40 CFR 63.1960]</p> <p>C. Description and duration of all periods when the Landfill Gas Flare (1990) was not operating for a period exceeding 1 hour and length of time the Landfill Gas Flare (1990) was not operating. [40 CFR 60.757(f)(3)]</p>

EMISSION TESTING REQUIREMENTS

16. An emission test of the Landfill Gas Flare (1990) shall be conducted each calendar year to demonstrate compliance with Condition Nos. 6, 7, 9 and 13:

- A. Submit a source test plan to the Air Pollution Control Officer for approval at least 30 days before the source test is to be performed.
- B. Notify the Air Pollution Control Officer at least 7 days prior to the source test date.
- C. Submit the source test report to the Air Pollution Control Officer within 60 days from the completion of the source test.
- D. The source test shall be conducted at the inlet and the exhaust of the Landfill Gas Flare (1990) and shall include a test for:
 - i. Either
 - a. NMOC destruction efficiency, or
 - b. Total NMOC (ppmvd at 3% O₂ measured as hexane, exhaust only)
 - ii. Oxides of nitrogen (exhaust only)
 - iii. Carbon monoxide (exhaust only)
 - iv. Reactive Organic Compounds (ROC) (exhaust only)
 - v. Hydrogen sulfide (inlet only)
 - vi. Combustion zone temperature
 - vii. Landfill gas flow rate

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
PERMIT TO OPERATE

Your application for this air quality Permit to Operate was evaluated for compliance with Sacramento Metropolitan Air Quality Management District (SMAQMD), state and federal air quality rules. The following listed SMAQMD rules are those that are most applicable to the operation of your equipment. Other rules may also be applicable.

<u>SMAQMD Rule No.</u>	<u>Rule Title</u>
201	General Permit Requirements
202	New Source Review
401	Ringelmann Chart
402	Nuisance
406	Specific Contaminants
420	Sulfur Content of Fuels
NSPS	40 CFR 60 Subpart WWW New Source Performance Standard: Municipal Solid Waste Landfills
NESHAP	40 CFR 63 Subpart AAAA National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

In addition, the conditions on this Permit to Operate may reflect some, but not all, requirements of these rules. There may be other conditions that are applicable to the operation of your equipment. Future changes in prohibitory rules may establish more stringent requirements which may supersede the conditions listed here.

For further information please consult your SMAQMD rulebook or contact the SMAQMD for assistance.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
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ATTACHMENT A

Actual Flare Combustion Temperature Observed
During the Most Recent Landfill Gas Flare (1990) Source Test

Date of Test	Actual 3-Hour Average Flare Combustion Temperature Observed During Source Test degrees F	Minimum 3-Hour Flare Combustion Temperature to Demonstrate Continuous Compliance degrees F
09-26-2006	1475	1425
Historical Data ↓		
09-21-2005	1450	1400
09-29-2004	1450	1400
11-21-2002	1400	1350
08-21-2000	1450	1400



AIR QUALITY
MANAGEMENT DISTRICT

PERMIT TO OPERATE

28th Street Landfill
Solid Waste Division
City of Sacramento
2812 Meadowview Road
Sacramento, CA 95832

Equipment Location: 20 28th Street, Sacramento

Permit No.	Equipment Description
12762(Rev01)	Landfill and landfill gas collection system consisting of: 1. Landfill area designated as WMU-A and WMU-B. 2. Perimeter wells. 3. Interior wells 4. Piping system to collect landfill gas from perimeter and interior wells and direct it to the LFG flares (P/O 09313 and P/O 14749). 5. Landfill gas blower.

SUBJECT TO THE FOLLOWING CONDITIONS:

GENERAL REQUIREMENTS

1. The equipment shall be properly maintained.
2. The Air Pollution Control Officer and/or authorized representatives, upon the presentation of credentials, shall be permitted:
 - A. To enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this Permit to Operate, and
 - B. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this Permit to Operate, and
 - C. To inspect any equipment, operation or method required in this Permit to Operate, and
 - D. To sample emissions from the source or require samples to be taken.

Date Issued: 03-26-2001
Date Revised: 03-12-2007
Date Expires: 09-01-2007 (unless renewed)

Larry Greene
Air Pollution Control Officer

by: Bruce Nixson

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
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3. This permit does not authorize the emission of air contaminants in excess of those allowed by Division 26, Part 4, Chapter 3, of the California Health and Safety Code or the rules and regulations of the SMAQMD.
4. A legible copy of this Permit to Operate shall be maintained on the premises with the equipment.

EMISSION LIMIT REQUIREMENTS

5. The landfill gas collection system shall operate such that the methane concentration is less than 500 ppmv above background at the surface of the landfill.
[40 CFR 60.753(d)]
6. The fugitive emissions from the landfill shall not exceed the following:

Pollutant	Maximum Allowable Emissions (A) lb/quarter
ROC	1,601

(A) Emissions are based on the following assumptions:

1. The landfill gas collection system captures 85% of the generated landfill gas. This results in 353 scfm of landfill gas released as a fugitive emission.
2. The landfill gas contains an average NMOC concentration of 822 ppm (as methane).
3. The collection system operates 24 hours/day and 92 days/quarter.
4. As a conservative assumption, all NMOC is treated as ROC. The City of Sacramento may speciate NMOC to account for and exclude exempt (non-ROC) compounds when determining compliance with this condition.

EQUIPMENT OPERATION REQUIREMENTS

7. The maximum design capacity of the 28th Street Landfill shall not exceed 6.514 million cubic yards.
8. The landfill gas collection system shall be designed to handle the maximum expected gas flow rate from that portion of the landfill that warrants control over the intended use period of the landfill gas control system.
[40 CFR 60.752(b)(2)(ii)(A)(1)]
9. Landfill gas shall be collected from each area, cell or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more if active or 2 years or more if closed or at final grade.
[40 CFR 60.753(a)]
10. Landfill gas shall be collected at a sufficient extraction rate.
[40 CFR 60.752(b)(2)(ii)(A)(3)]
11. The landfill gas collection system shall be designed to minimize off-site migration of subsurface landfill gas.
[40 CFR 60.752(b)(2)(ii)(A)(4)]

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12. The landfill gas collection system shall operate such that all collected gases are vented to the flares or delivered to Blue Diamond Almond Growers. 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 to the atmosphere shall be closed within 1 hour.
[40 CFR 60.753(e)]
13. A sampling port and a temperature measuring device or an access port for temperature measurements shall be installed at each landfill gas wellhead.
[40 CFR 60.756(a)]
14. The landfill gas collection system shall operate such that each landfill gas wellhead exhibits negative pressure except under the following conditions:
- A. A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire.
 - B. Use of a geomembrane or synthetic cover.
 - C. A decommissioned well.
 - D. The gas migration well is not placed in refuse (migration control well).
 - E. A well is temporarily shut-off or disconnected to prevent a fire.
[40 CFR 60.753(b)]
15. A. The landfill gas collection system shall operate such that each interior landfill gas wellhead achieves the following:
- i. A landfill gas temperature less than 55°C and
 - ii. Either a nitrogen level less than 20 percent or an oxygen level less than 5 percent.
- B. The owner or operator 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.
[40 CFR 60.753(c)]

MONITORING AND CORRECTIVE ACTION REQUIREMENTS

16. A device shall be installed that records flow to or bypass of the flare. The owner or operator shall either:
- A. Install, calibrate and maintain a landfill gas flow rate measuring device that shall record the flow to the flare at least every 15 minutes; or
 - B. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration.
[40 CFR 60.756(b)(2)]
17. If applicable, a visual inspection of the seal or closure mechanism on the landfill gas bypass valve for the flare or landfill gas treatment system shall be conducted at least once every month to ensure that the valve is maintained in the closed position and that the landfill gas flow is not diverted through the bypass line.
[40 CFR 60.756(b)(2)(ii)]

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18. Gauge pressure shall be measured monthly in the landfill gas collection header at each individual wellhead.
- A. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the conditions allowed under Condition No. 14. 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.
 - B. Any attempted corrective measure shall not cause exceedances of other operational or performance standards.
[40 CFR 60.755(a)(3) and 40 CFR 60.756(a)(1)]
19. Temperature and either the nitrogen concentration (%) or the oxygen concentration (%) shall be measured monthly for each interior well.
- A. The nitrogen level shall be determined using U.S. EPA Method 3C unless an alternative method is established as allowed by 40 CFR 60.752(b)(2)(i).
 - B. The oxygen level shall be determined using U.S. EPA Method 3A or 3C unless an alternative method is established as allowed by 40 CFR 60.752(b)(2)(i).
 - C. If a well exceeds the operating parameters stated in Condition No. 15, action shall be initiated to correct the exceedance within 5 calendar days. 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.
 - D. Any attempted corrective measure shall not cause exceedances of other operation or performance standards.
[40 CFR 60.753(c)(1), 40 CFR 60.753(c)(2), 40 CFR 60.755(a)(5), 40 CFR 60.756(a)(2), 40 CFR 60.756(a)(3)]
20. Surface concentrations of methane shall be measured quarterly around the perimeter of the collection area, 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. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.
- Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency to quarterly monitoring.**
[40 CFR 60.756(f)]

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- A. Each area shall be monitored using an organic vapor analyzer, flame ionization detector or other portable monitor.
- B. The organic vapor analyzer, flame ionization detector or other portable monitor shall meet the following specifications:
- The portable analyzer shall meet the instrument specifications provided in Section 3 of U.S. EPA Method 21, except that "methane" shall replace all references to VOC.
 - The calibration gas shall be methane, diluted to a nominal concentration of 500 ppmv in air.
 - To meet the performance evaluation requirements in Section 3.1.3 of U.S. EPA Method 21, the instrument evaluation procedures of Section 4.4 of U.S. EPA Method 21 shall be used.
 - The calibration procedures provided in Section 4.2 of U.S. EPA Method 21 shall be followed immediately before commencing a surface monitoring survey.
- C. 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.
- D. Surface emission monitoring shall be performed in accordance with Section 4.3.1 of U.S. EPA Method 21, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.
- E. Any reading of 500 ppmv or more of methane above background at any location shall be recorded as a monitored exceedance and the following actions shall be taken. As long as the specified actions listed in subsections i. through v. below are taken, the exceedance is not a violation of Condition No. 5.
- The location of each monitored exceedance shall be marked and the location recorded.
 - 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.
 - 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 subsection v. below shall be taken, and no further monitoring of that location is required until the action specified in subsection v. below has been taken.
 - Any location that initially showed an exceedance but has a methane concentration less than 500 ppmv methane above background at the 10-day re-monitoring specified in subsection ii. or iii. above shall be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 ppmv methane above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in subsection iii. above or v. below shall be taken.
 - For any location where monitored methane concentration equals or exceeds 500 ppmv 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 Air Pollution Control Officer for approval.
- [40 CFR 60.753(d), 40 CFR 60.755(c)]**
21. A program shall be implemented to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.
- [40 CFR 60.755(c)(5)]**

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
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RECORDKEEPING AND REPORTING REQUIREMENTS

22. The following records shall be continuously maintained onsite for the most recent five year period and shall be made available to the Air Pollution Control Officer upon request. Monthly and quarterly records shall be made available within 30 days of the end of the reporting period.

Frequency	Information to be recorded
At all times	<p>A. The design capacity report which is the basis for this facility being subject to the provisions of 40 CFR 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. [40 CFR 60.758(a)]</p> <p>B. The maximum expected gas generation flow rate as calculated using the methodology in 40 CFR 60.755(a)(1). [40 CFR 60.758(b)(1)(i)]</p> <p>C. The density of wells, horizontal collectors, surface collectors or other gas extraction devices determined using the procedures in 40 CFR 60.759(a)(1). [40 CFR 60.758(b)(1)(ii)]</p> <p>D. Continuous record of either: i. The indication of landfill gas flow to the flare or the indication of landfill gas bypass flow, or ii. Monthly inspections of car-seals or lock-and-key configurations used to seal landfill gas bypass lines. [40 CFR 60.758(c)(2)]</p> <p>E. Record of all collection system exceedances of the following operational standards at each individual well: i. Landfill gas collection wellhead gauge pressure - Condition No. 14. ii. Landfill gas temperature - Condition No. 15.A. iii. Either nitrogen or oxygen concentration - Condition No. 15.A. iv. Surface methane concentrations - Condition No. 5. Where there is an exceedance, the reading in the subsequent month shall be recorded and whether or not the second reading is an exceedance and the location of the exceedance. [40 CFR 60.758(e)]</p> <p>F. Plot map showing each existing and planned landfill gas collector in the system and providing a unique identification location label for each collector. [40 CFR 60.758(d)]</p> <p>G. Record of the installation date and location of all newly installed landfill gas collectors. [40 CFR 60.758(d)(1)]</p>

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Frequency	Information to be recorded
	H. If applicable, documentation of the nature, date of deposition, amount and location of asbestos-containing or non-degradable waste excluded from collection as well as any non-productive areas excluded from collection. [40 CFR 60.758(d)(2)]
Monthly	I. Record of the following equipment operating parameters specified to be monitored at each individual well: <ul style="list-style-type: none"> i. Landfill gas well head gauge pressure - Condition No. 14. ii. Landfill gas temperature - Condition No. 15.A. iii. Either nitrogen or oxygen level - Condition No. 15.A. [40 CFR 60.758(c)] J. Record of monitoring for cover integrity and any cover repairs implemented.
Quarterly	K. Record of the following: <ul style="list-style-type: none"> i. Surface methane concentrations - Condition No. 5. [40 CFR 60.758(c)]

23. A written report shall be submitted to the Air Pollution Control Officer by the date indicated and shall contain the following information.

Frequency	Information to be submitted
Report by: (1) July 30 of each year for the six month period: Jan. - June and (2) February 28 of each year for the six month period: July - Dec. [40 CFR 63.1980(a)]	A. Value and length of time for exceedance of the following parameters at each individual well : <ul style="list-style-type: none"> i. Landfill gas well head gauge pressure - Condition No. 14 <ul style="list-style-type: none"> a. Identify instances when positive pressure occurs in efforts to avoid a fire. ii. Landfill gas temperature - Condition No. 15.A. iii. Either nitrogen or oxygen concentration - Condition No. 15.A. iv. Surface methane concentrations - Condition No. 5. [40 CFR 60.757(f)(1)] B. If applicable, description and duration of all periods when the landfill gas stream is diverted from the flare through a landfill gas bypass line or the indication of bypass flow as specified to be monitored in Condition No. 16. [40 CFR 60.757(f)(2)] C. If applicable, the results of visual inspection of the seal or closure mechanism on the landfill gas valve bypassing the flare, as specified to be monitored in Condition No. 17, to ensure that the valve is maintained in the closed position and that the landfill gas flow is not diverted through the bypass line. [40 CFR 60.757(f)(2)] D. Description, date and duration of all periods when the control device was not operating for a period of at least one hour. [40 CFR 60.757(f)(3)]

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
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Frequency	Information to be submitted
	<p>E. All periods when the collection system was not operating in excess of 5 days. [40 CFR 60.757(f)(4)]</p> <p>F. The location of each exceedance of the 500 ppmv methane concentration limit pursuant to Condition No. 20 and the concentration recorded at each location for which an exceedance was recorded in the previous month. [40 CFR 60.757(f)(5)]</p> <p>G. The date of installation and the location of each well or collection system expansion added pursuant to Condition Nos. 19.C and 20.E.v. [40 CFR 60.757(f)(6)]</p>
<p>Within 30 days of the landfill closing and waste acceptance cessation</p>	<p>H. Each owner or operator of a controlled landfill shall submit a closure report within 30 days of waste acceptance cessation.</p> <p>I. The Air Pollution Control Officer may request additional information as may be necessary to verify that permanent closure has taken place in accordance with 40 CFR 258.60.</p> <p>J. If a closure report has been submitted to the Air Pollution Control Officer, no additional wastes may be placed into the landfill without filing a notification of modification as described under 40 CFR 60.7(a)(4). [40 CFR 60.757(d)]</p>
<p>30 days prior to the removal or cessation of control equipment operation</p>	<p>K. Each owner or operator of a controlled landfill shall submit an equipment removal report 30 days prior to removal or cessation of operation of the control equipment.</p> <p>L. The equipment removal report shall contain all of the following items:</p> <ul style="list-style-type: none"> i. A copy of the closure report submitted in accordance with 40 CFR 60.757(d). ii. A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired. iii. 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. <p>M. The Air Pollution Control Officer may request such additional information as may be necessary to verify that all of the conditions for removal in 40 CFR 60.752(b)(2)(v) have been met. [40 CFR 60.757(e)]</p>

24. Startup, Shutdown and Malfunction (SSM) Periodic and Immediate Reports

A. Periodic Reports

- i. If actions taken during a SSM event are consistent with the procedures specified in the SSM Plan the permittee shall state such information in a SSM Report.

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- ii. The SSM Report shall be submitted by February 28 and July 30 of each year but is only required if a SSM event occurred during the reporting period January 01 - June 30 and July 01 - December 31 of each year.
- iii. The SSM Report shall contain:
 - (a) Number, duration and a brief description of each SSM event.
 - (b) A letter containing the name, title and signature of the responsible official who is certifying the accuracy of the report.

[40 CFR 63.1955(b), 40 CFR 63.1980(b), 40 CFR 63.10(d)(5)(i)]

B. Immediate Reports

- i. If actions taken during a SSM event are not consistent with the procedures specified in the SSM Plan the permittee shall:
 - (a) Report to the Air Pollution Control Officer, by telephone call or facsimile (FAX), within 2 working days after commencing actions inconsistent with the SSM Plan.
 - (b) Follow with a letter to the Air Pollution Control Officer within 7 working days after the end of the SSM event that:
 - (i) Contains the name, title and signature of the responsible official who is certifying the accuracy of the report.
 - (ii) Explains the circumstances of the event.
 - (iii) Explains the reasons for not following the SSM Plan
 - (iv) Explains whether any excess emissions and/or parameter monitoring exceedances are believed to have occurred.

[40 CFR 63.1955(b), 40 CFR 63.1980(b), 40 CFR 63.10(d)(5)(ii)]

25. The permittee shall maintain files of all required information (including all reports and notifications) recorded in a form suitable and readily available for expeditious inspection and review. The files shall be retained for at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report or record. At a minimum, the most recent 2 years of data shall be retained on site. The remaining 3 years of data may be retained off site. Such files may be maintained on microfilm, on a computer, on computer floppy disks, on magnetic tape disks or on microfiche.

[40 CFR 63.1955(b), 40 CFR 63.1980(b), 40 CFR 63.10(d)(5)(ii)]

Frequency	Information to be recorded
At all times	A. The occurrence and duration of each startup, shutdown or malfunction of operation (i.e., process equipment). B. The occurrence and duration of each malfunction of the required air pollution control and monitoring equipment. C. All required maintenance performed on the air pollution control and monitoring equipment. D. Actions taken during periods of startup, shutdown and malfunction (including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation) when such actions are different from the procedures specified in the affected source's Startup, Shutdown and Malfunction Plan.

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Frequency	Information to be recorded
	<p>E. All information necessary to demonstrate conformance with the affected source's Startup, Shutdown and Malfunction Plan when all actions taken during periods of startup, shutdown and malfunction (including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation) are consistent with the procedures specified in such plan. (The information needed to demonstrate conformance with the Startup, Shutdown and Malfunction Plan may be recorded using a "checklist" or some other effective form of recordkeeping, in order to minimize the recordkeeping burden for conforming events)</p>

Your application for this air quality Permit to Operate was evaluated for compliance with Sacramento Metropolitan Air Quality Management District (SMAQMD), state and federal air quality rules. The following listed SMAQMD rules are those that are most applicable to the operation of your equipment. Other rules may also be applicable.

<u>SMAQMD Rule No.</u>	<u>Rule Title</u>
201	General Permit Requirements
202	New Source Review
402	Nuisance
NSPS	40 CFR 60 Subpart WWW New Source Performance Standard: Municipal Solid Waste Landfills
NESHAP	40 CFR 63 Subpart AAAA National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

In addition, the conditions on this Permit to Operate may reflect some, but not all, requirements of these rules. There may be other conditions that are applicable to the operation of your equipment. Future changes in prohibitory rules may establish more stringent requirements which may supersede the conditions listed here.

For further information please consult your SMAQMD rulebook or contact the SMAQMD for assistance.



PERMIT TO OPERATE

28th Street Landfill
Solid Waste Division
City of Sacramento
2812 Meadowview Road
Sacramento, CA 95832

Equipment Location: 20 28th Street, Sacramento

Permit No.	Equipment Description
14749(Rev01)	Landfill gas flare (1997), John Zink, Model ZTOF, enclosed type, 2,000 cfm capacity, 54.6 MMBTU/hour at 455 BTU/cf

SUBJECT TO THE FOLLOWING CONDITIONS:

GENERAL REQUIREMENTS

1. The equipment shall be properly maintained.
2. The Air Pollution Control Officer and/or authorized representatives, upon the presentation of credentials, shall be permitted:
 - A. To enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this Permit to Operate, and
 - B. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this Permit to Operate, and
 - C. To inspect any equipment, operation or method required in this Permit to Operate, and
 - D. To sample emissions from the source or require samples to be taken.
3. This Permit to Operate does not authorize the emission of air contaminants in excess of those allowed by Division 26, Part 4, Chapter 3, of the California Health and Safety Code or the rules and regulations of the SMAQMD.

Date Issued: 01-31-2001
Date Revised: 03-12-2007
Date Expires: 09-01-2007 (unless renewed)

Larry Greene
Air Pollution Control Officer

by: Bruce Nixon

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
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4. A legible copy of this Permit to Operate shall be maintained on the premises with the equipment.

EMISSION LIMIT REQUIREMENTS

5. The Landfill Gas Flare (1997) shall not discharge into the atmosphere any visible air contaminants other than uncombined water vapor, for a period or periods aggregating more than three minutes in any one hour, which are as dark or darker than Ringelmann No. 1 or equivalent to or greater than 20% opacity.

6. Emissions from the Landfill Gas Flare (1997) shall not exceed the following:

Pollutant	Maximum Allowable Emissions
ROC	A. 2% of inlet NMOC (equivalent to a 98% NMOC destruction efficiency) or 20 ppmvd at 3% O ₂ measured as hexane, and
NO _x (BACT)	0.06 lb/MMBTU (high heating value)
CO (BACT)	0.20 lb/MMBTU (high heating value)

7. Emissions from the Landfill Gas Flare (1997) shall not exceed the following:

Pollutant	Emission Factor (A) lb/MMcf	Maximum Allowable Emissions (B)	
		lb/day	lb/quarter
ROC	N/A	10	920
NO _x	27.3	79	7,233
SO _x	N/A	10	920
PM ₁₀	24.16	70	6,402
CO	91	262	24,111

- (A) Emission factors for NO_x and CO are based on SMAQMD permit limits of 0.06 lb/MMBTU and 0.20 lb/MMBTU respectively and a heat content of 455 BTU/scf of landfill gas.
 Emission factor for PM₁₀ is based on the initial performance test value which has been doubled to insure a compliance margin.
 Emissions for ROC and SO_x are based on BACT trigger level limit of 10 lb/day.
- (B) Emissions based on 2,000 scfm landfill gas combustion rate, 24 hours/day and 92 days/quarter.

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PERMIT TO OPERATE

EQUIPMENT OPERATION AND MONITORING REQUIREMENTS:

8. The amount of landfill gas combusted by the Landfill Gas Flare (1997) shall not exceed the following limit:

Flare Identifier	Maximum Allowable Landfill Gas Combusted by Landfill Gas Flare (1997) (A) million cubic feet/quarter
Landfill Gas Flare (1997)	265

(A) Based on the flare operating at maximum capacity of 2000 scfm, 24 hours/day and 92 days/quarter.

9. The sulfur content of the landfill gas combusted in the Landfill Gas Flare (1997) shall not exceed 1.3 grains/100 scf as hydrogen sulfide (H₂S).

10. A sampling port, or other method approved by the Air Pollution Control Officer, shall be installed at the inlet gas line to the Landfill Gas Flare (1997). The sampling port shall be located so that an accurate volume flow measurement can be performed.

11. The Landfill Gas Flare (1997) exhaust sample ports shall be permanent, accessible and located and constructed as per applicable U.S. EPA, CARB and U.S. OSHA requirements.

12. The Landfill Gas Flare (1997) shall be equipped with a temperature monitoring device.

A. The thermocouple used to measure the flare temperature shall be located at a distance that is greater than the distance equivalent to 0.6 seconds at the maximum flow rate downstream of the burner.

B. The temperature monitoring device shall be equipped with a continuous recorder.

C. The temperature monitoring device shall have an accuracy of ± 1 percent of the temperature being measured expressed in degrees Celsius or ± 0.5 degrees C, whichever is greater.

D. The temperature monitoring device is not precluded from expressing measurements in degrees Fahrenheit as long as the aforementioned accuracy is met.

E. The owner or operator shall submit to the Air Pollution Control Officer for approval a description of the temperature monitoring device calibration procedure and schedule of calibration.

13. The Landfill Gas Flare (1997) shall operate at a minimum combustion zone temperature equal to the 3-hour average temperature (measured by the thermocouple specified in Condition No. 12) as determined during the most recent complying source test minus 28 degrees C (50 degrees F)

(The data from the most recent source test is summarized in Attachment A indicating the 3-hour average temperature measured by the thermocouple in Condition No. 12.)

A. The minimum combustion zone temperature shall not be in effect for a maximum of five days in each calendar year when emissions testing is being performed to determine if the required NMOC destruction efficiency or NMOC exhaust concentration can be met at a lower combustion zone temperature.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
PERMIT TO OPERATE

RECORDKEEPING AND REPORTING REQUIREMENTS:

14. The following record shall be continuously maintained on site for the most recent 5 year period, except as noted, and shall be made available to the Air Pollution Control Officer upon request. Quarterly records shall be made available within 30 days of the end of the reporting period.

Frequency	Information to be recorded
At all times	<p>A. The following information measured during the initial performance test shall be maintained for the life of the Landfill Gas Flare (1997). Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. [40 CFR 60.758(b)]</p> <ul style="list-style-type: none"> i. The average combustion temperature of the Landfill Gas Flare (1997) measured at least every 15 minutes and averaged over the same time period as the performance test. [40 CFR 60.758(b)(2)(i)] ii. The percent reduction of NMOC, determined as specified in 40CFR60.752(b)(2)(iii)(B), achieved by the Landfill Gas Flare (1997). [40 CFR 60.758(b)(2)(ii)] <p>B. All 3 hour periods of operation during which the Landfill Gas Flare (1997) average combustion temperature was below the limit established in Condition No. 13. [40 CFR 60.758(c)(1)(i)]</p> <p>C. All deviations that occur in continuous parameter monitoring data: [40 CFR 63.1960]</p> <ul style="list-style-type: none"> i. Deviation is defined as when 1 hour or more of the hours during the 3 hour block averaging period does not constitute a valid hour of data. [40 CFR 63.1965(b)] ii. A valid hour of data must have measured values for at least three 15 minute monitoring periods within the hour. [40 CFR 63.1965(b)] iii. Continuous parameter monitoring data collected during the following events are not to be included in any 3 hour block average: [40 CFR 63.1975(a) - (d)] <ul style="list-style-type: none"> (a) Monitoring system breakdowns, repairs, calibration checks and zero (low level) and high level adjustments. (b) Startups. (c) Shutdowns. (d) Malfunctions <p>D. Record of calibration reports for the temperature monitoring device.</p>
Quarterly	<p>E. The combined amount of landfill gas consumed in Landfill Gas Flare (1990) and Landfill Gas Flare (1997). (cubic feet/quarter)</p>

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15. A written report shall be submitted to the Air Pollution Control Officer annually by the date indicated and shall contain the following information.

Frequency	Information to be submitted
Annually by: February 28 for the previous calendar year	A. All 3-hour periods of operation during which the average Landfill Gas Flare (1997) combustion temperature was more than 50 degrees F (28 degrees C) below the 3-hour average Landfill Gas Flare (1997) combustion temperature during the most recent performance test at which compliance with 40 CFR 60.752(b)(2)(iii) was determined. [40 CFR 60.758(c)(1)(i)] B. All deviations that occur in continuous parameter monitoring data. [40 CFR 63.1960] C. Description and duration of all periods when the Landfill Gas Flare (1997) was not operating for a period exceeding 1 hour and length of time the Landfill Gas Flare (1997) was not operating. [40 CFR 60.757(f)(3)]

EMISSION TESTING REQUIREMENTS

16. An emission test of the Landfill Gas Flare (1997) shall be conducted each calendar year to demonstrate compliance with Condition Nos. 6, 7, 9 and 13:

- A. Submit a source test plan to the Air Pollution Control Officer for approval at least 30 days before the source test is to be performed.
- B. Notify the Air Pollution Control Officer at least 7 days prior to the source test date.
- C. Submit the source test report to the Air Pollution Control Officer within 60 days from the completion of the source test.
- D. The source test shall be conducted at the inlet and the exhaust of the Landfill Gas Flare (1997) and shall include a test for:
 - i. Either
 - a. NMOC destruction efficiency, or
 - b. Total NMOC (ppmvd at 3% O₂ measured as hexane, exhaust only)
 - ii. Oxides of nitrogen (exhaust only)
 - iii. Carbon monoxide (exhaust only)
 - iv. Reactive Organic Compounds (ROC) (exhaust only)
 - v. Hydrogen sulfide (inlet only)
 - vi. Combustion zone temperature
 - vii. Landfill gas flow rate

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Your application for this air quality Permit to Operate was evaluated for compliance with Sacramento Metropolitan Air Quality Management District (SMAQMD), state and federal air quality rules. The following listed SMAQMD rules are those that are most applicable to the operation of your equipment. Other rules may also be applicable.

<u>SMAQMD Rule No.</u>	<u>Rule Title</u>
201	General Permit Requirements
202	New Source Review
401	Ringelmann Chart
402	Nuisance
406	Specific Contaminants
420	Sulfur Content of Fuels
NSPS	40 CFR 60 Subpart WWW New Source Performance Standard: Municipal Solid Waste Landfills
NESHAP	40 CFR 63 Subpart AAAA National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

In addition, the conditions on this Permit to Operate may reflect some, but not all, requirements of these rules. There may be other conditions that are applicable to the operation of your equipment. Future changes in prohibitory rules may establish more stringent requirements which may supersede the conditions listed here.

For further information please consult your SMAQMD rulebook or contact the SMAQMD for assistance.

ATTACHMENT A

**Actual Flare Combustion Temperature Observed
 During the Most Recent Landfill Gas Flare (1997) Source Test**

Date of Test	Actual 3-Hour Average Flare Combustion Temperature Observed During Source Test degrees F	Minimum 3-Hour Flare Combustion Temperature to Demonstrate Continuous Compliance degrees F
09-26-2006	1525	1475
Historical Data ↓		
09-21-2005	1450	1400
09-29-2004	1450	1400
09-24-2002	1375	1325
08-22-2000	1375	1325

ATTACHMENT C

**SMAQMD Rule 406
Compliance Calculations
for
Flares**

Calculation of SO₂ and PM Emission Concentrations From Flares

Flares:

Compliance with the SO₂ and PM emission concentrations for both flares will be shown by demonstrating compliance with the 1990 flare.

Assumptions for calculations:

Landfill Gas (LFG) F-factor = 7,963 dscf EG (exhaust gas)/MMBTU (2010 source test data)
LFG Heat Content = 409.7 BTU/scf LFG (2010 source test data)
Outlet Oxygen = 13.86% (source test data)
Outlet Carbon Dioxide = 6.2% (source test data)
SO₂ Emission Factor = 3.43 lb SO₂/MMscf LFG
PM Emission Factor = 32 lb PM₁₀/MMscf LFG

Molecular Weight of SO₂ = 64 grams/mole
Standard Molar Volume = 0.8493 dscf/mol (at 68 degrees F and 1 atm)

PM₁₀ concentration (combustion contaminants):

= $\frac{\text{Flare PM}_{10} \text{ mass emission rate (grains/min)}}{\text{Flare volumetric Exhaust Gas flow rate (dscf EG/min)}}$
= $\frac{(32 \text{ lb PM}_{10}/\text{MMscf LFG}) (7000 \text{ grains/lb}) (1500 \text{ scf LFG/min})}{(1500 \text{ scf LFG/min}) (409.7 \text{ BTU/scf LFG}) (7963 \text{ dscf EG/MMBTU})}$
= $\frac{336 \text{ grains PM}_{10}/\text{min}}{4894 \text{ dscf EG/min}}$ **at 0% O₂ based on definition of Fd Factor**
= $\frac{336 \text{ grains PM}_{10}/\text{min}}{14529 \text{ dscf EG/min}}$ **at 13.86% O₂ actual test condition**
= 0.023 grains PM₁₀/dscf EG **at 6.2% CO₂ actual test condition**
= 0.045 grains PM₁₀/dscf EG **at 12% CO₂**

SO₂ Concentration (%SO₂ by volume):

= $\frac{\text{Flare volumetric SO}_2 \text{ emission rate (scf SO}_2/\text{min)}}{\text{Flare volumetric combustion gas emission rate (dscf EG/min)}}$
= $\frac{(3.43 \text{ lb SO}_2/\text{MMscf LFG}) (453.6 \text{ grams/lb}) (1500 \text{ scf LFG/min}) (0.8493 \text{ ft}^3/\text{g-mole}) (1 \text{ g-mole}/64 \text{ grams})}{(1500 \text{ scf LFG/min}) (409.7 \text{ BTU/scf LFG}) (7963 \text{ dscf EG/MMBTU})}$
= $\frac{0.031 \text{ scf SO}_2/\text{min}}{4894 \text{ dscf EG/min}}$ **at 0% O₂ based on definition of Fd Factor**
= $\frac{0.031 \text{ scf SO}_2/\text{min}}{13284 \text{ dscf EG/min}}$ **at 13.2% O₂ actual test condition**
= 0.0002% SO₂ by volume

ATTACHMENT C

SMAQMD RULE 406 COMPLIANCE CALCULATIONS FOR FLARES

Calculation of SO₂ and PM Emission Concentrations from Flares

Compliance with the SO₂ and PM emission concentrations for both flares will be shown by demonstrating compliance with the 1990 flare.

Assumptions for calculations:

Landfill Gas (LFG) F-factor	=	7,963 dscf EG (exhaust gas)/MMBTU (2010 source test data)
LFG Heat Content	=	409.7 BTU/scf LFG (2010 source test data)
Outlet Oxygen	=	13.86% (source test data)
Outlet Carbon Dioxide	=	6.2% (source test data)
SO ₂ Emission Factor	=	3.43 lb SO ₂ /MMscf LFG
PM Emission Factor	=	32 lb PM ₁₀ /MMscf LFG
Molecular Weight of SO ₂	=	64 grams/mole
Standard Molar Volume	=	0.8493 dscf/mol (at 68 degrees F and 1 atm)

PM₁₀ concentration (combustion contaminants):

$$\begin{aligned} &= \frac{\text{Flare PM}_{10} \text{ mass emission rate (grains/min)}}{\text{Flare volumetric Exhaust Gas flow rate (dscf EG/min)}} \\ &= \frac{(32 \text{ lb PM}_{10}/\text{MMscf LFG}) (7000 \text{ grains/lb}) (1500 \text{ scf LFG/min})}{(1500 \text{ scf LFG/min}) (409.7 \text{ BTU/scf LFG}) (7963 \text{ dscf EG/MMBTU})} \\ &= \frac{336 \text{ grains PM}_{10}/\text{min}}{4894 \text{ dscf EG/min at 0\% O}_2 \text{ based on definition of Fd Factor}} \\ &= \frac{336 \text{ grains PM}_{10}/\text{min}}{14529 \text{ dscf EG/min at 13.86\% O}_2 \text{ actual test condition}} \\ &= 0.023 \text{ grains PM}_{10}/\text{dscf EG at 6.2\% CO}_2 \text{ actual test condition} \\ &= 0.045 \text{ grains PM}_{10}/\text{dscf EG at 12\% CO}_2 \end{aligned}$$

SO₂ Concentration (%SO₂ by volume):

$$\begin{aligned} &= \frac{\text{Flare volumetric SO}_2 \text{ emission rate (scf SO}_2/\text{min)}}{\text{Flare volumetric combustion gas emission rate (dscf EG/min)}} \\ &= \frac{(3.43 \text{ lb SO}_2/\text{MMscf LFG}) (453.6 \text{ grams/lb}) (1500 \text{ scf LFG/min}) (0.8493 \text{ ft}^3/\text{g-mole}) (1 \text{ g-mole}/64 \text{ grams})}{(1500 \text{ scf LFG/min}) (409.7 \text{ BTU/scf LFG}) (7963 \text{ dscf EG/MMBTU})} \\ &= \frac{0.031 \text{ scf SO}_2/\text{min}}{4894 \text{ dscf EG/min at 0\% O}_2 \text{ based on definition of Fd Factor}} \\ &= \frac{0.031 \text{ scf SO}_2/\text{min}}{13284 \text{ dscf EG/min at 13.2\% O}_2 \text{ actual test condition}} \\ &= 0.0002\% \text{ SO}_2 \text{ by volume} \end{aligned}$$