

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 8	PAGE 1
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PERMIT TO CONSTRUCT

APPLICANT'S NAME: Riverside County Waste Management Department

MAILING ADDRESS: 14310 Frederick Street,
Moreno Valley, CA 92553

EQUIPMENT ADDRESS: 31125 Ironwood Avenue
Moreno Valley, CA 92555

FACILITY ID #: 6979

BACKGROUND:

This application 509914 was filed to replace an existing flare (34.1 MMBTU rating, treating 1250 scfm) permitted under A/N 472572 (P/N G5699) of landfill gas flow due to anticipated increase in landfill gas generated at this active landfill. The initial Title V for this facility was approved in September 2008. Since this is a Title V facility, the proposed flare will be subject to LAER. The landfill facility is located in Moreno Valley with closest residential and residential receptors approximately more than mile away.

Search of the compliance database has indicated several NC's and one NOV have been issued to this facility since September 2008. As per the source test notifications and equipment list in compliance database applicant has complied with NOV.

Applicant has filed for notice of exemption on April 13, 2010 as CEQA requirements with County Clerk.

In addition to the flare applicant also operates a permitted IC engine (using landfill gas, A/N 444070, P/N F80754, 1777 HP) at this site which will continue to be here as per the applicant.

PROCESS DESCRIPTION

The proposed flare will be used to excess landfill gas generate at this facility. The collected gas from the collection header will be combusted either in this flare or IC engine.

EMISSIONS:

Assumptions: The flare has a BTU rating of 54.6 MMBTU.

Methane content of landfill gas = 47 %

BTU for 47 % of methane in landfill gas = 455 BTU

As per 2009 source test report attached with application package, the BTU rating of landfill gas was 421.

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BTU of 455 was based on the landfill flow and the BTU rating of the flare.

Landfill gas flow rate = 2000 scfm

Calculated MMBTU/hr of Flare = 2000 scf/min X 60 min/hr X 455 BTU X 10⁻⁶ = 54.6 MMBTU/hr

Exhaust volume was assumed to be 16,500 scfm, as the combustion air blower is only rated for 14,500 scfm and the landfill gas flow is 2,000 scfm.

Source test reports from inspection folder for site were reviewed and Formaldehyde was also identified in the IC engine emissions.

Applicant was asked to send us the source test report for the existing landfill gas flare. Pertinent pages of the source test report were printed and attached in the application folder. Concentrations of halogenated compounds in Table 4-5 in the 2009 source test report was low, so the production of HCl was not considered in the effluent.

Last source test attached with the application package shows the inlet NMOC (VOC) concentration of 11,420 (as methane) in the inlet of flare. Based on the 2009 source test, destruction efficiency of greater than 99.9% was achieved for VOC's. VOC's in the effluent stream were also calculated based on 20 PPMV(as hexane) effluent limit as per rule 1150.1

No.	Criteria Pollutant Name	Emission Factors	Emission factor Units	Flare Flow in scfm	MMBTU/hour of Flare	pollutant in lb/hr	pollutant in lb/day	pollutant in lb/year	pollutant in tons/year
1	Nox	0.025	lb/MMBTU	2000	54.60	1.36500	32.760	11957.400	5.97870
2	CO	0.06	lb/MMBTU	2000	54.60	3.27600	78.624	28697.760	14.34888
3	PM10	10	lbs/MMCFM	2000	54.60	1.20000	28.800	10512.000	5.25600
4	Sox	75	PPMV	2000	54.60	1.51979	36.475	13313.351	6.65668
5	VOC - 98% destruction efficiency	12000	PPMV	2000	54.60	1.21583	29.180	10650.681	5.32534
6	VOC -- 20 PPMV in exhaust	20	PPMV	16500	54.60	4.49288	107.829	39357.594	19.67880
7	HCHO	1.169	lbs/MMCFM	2000	54.60	0.14028	3.367	1228.853	0.61443
8	PAH without Naphthalene	0.003	lbs/MMCFM	2000	54.60	0.00036	0.008640	3.154	0.00158
9	Napthalene	0.008	lbs/MMCFM	2000	54.60	0.00096	0.02304	8.410	0.00420

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Applicant has indicated that the existing flare will be shut down once the new flare starts operating. A permit condition has been inserted to prevent operation of both flares at the same time.

*CO emissions numbers are extremely conservative, if we estimate the emissions based on existing source test data, the emission number will be far lower. The CO emission factor was taken from BACT/emissions warranty documents provided by the manufacturer.

*NO_x numbers are based on the BACT level.

*PM-10 emission factor of 10 lbs/MMSCFM was assumed. 2009 source test had indicated an emissions factor of 3.9 lbs/MMSCFM.

*SO_x emissions were calculated on the basis of 75 PPMV of H₂S in the inlet stream, based on 2009 source test SO_x emissions were 40 PPMV. The last exhaust report showed sulfur compound concentration of 27.3 PPMV in the landfill gas.

*VOC emissions were calculated on the assumption of 20 PPMV (as hexane) of VOC's in the effluent stream. Rule 1150.1

**VOC emissions were also calculated based on 98% destruction efficiency of inlet VOC's (assumed to be 12,000 PPMV in the inlet, based on previous source tests for IC engine and flare) = 12,000 x 0.02 = 240 PMV in the effluent. A/N 472572 emissions calculations were also done with 12,000 NMOC content. Exhaust volume of 16,500 will be used as mentioned above.

***AB2588 default E F for LFG flare = 1.169 lbs HCHO/MMscf (email, Sept. 12, 2006 from Charles Tupac)
Ventura Air Pollution Control District: 0.003 lbs Total PAH/MMscf (without Napthalene)
0.011 lbs/MMscf with Napthalene

This landfill gas collection system flare will be complying with 20 PPMV NMOC effluent limits measured at 3 % excess oxygen limit or 98% destruction efficiency.

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Criteria pollutant name	A/N 472572 Old Flare NSR value in lb/hr	New Flare Emissions calculated value in lb/hr	Difference in lb/hr value	Difference in lb/day value	Rule 212 (g) notice limits in lbs/day	Public Notice Required Yes/No
Nox	2.05	1.37	-0.69	-16.44	40	NO
CO	6.83	3.27	-3.56	-85.44	220	NO
PM10	1.5	1.20	-0.30	-7.20	30	NO
Sox	1.01	1.52	0.51	12.24	60	NO
VOC	0.75	1.22	0.47	11.18	30	NO

TOXIC AIR CONTAMINANT EMISSIONS:

This site is at a remote location and there are no residential or commercial receptors nearby with nearest receptors almost more than one mile away. To be conservative both residential and commercial receptor distances were assumed to be 1000 meters.

Residential Receptor = 1000 meter
Commercial Receptor = 1000 meter

Stack Height = 40 feet (see attached air quality impact/risk assessment section)

Rule 1401 evaluation will be completed with HCHO included in the toxics list. Both residential and commercial risks are less than one in a million.

The risk from the existing flare was 2.05×10^{-8} for residential and 2.87×10^{-9} for commercial receptors. See pertinent pages from previous evaluation (A/N 416359 or A/N 472572) were printed and placed in the application folder.

The MICR values are determined to be 8.43×10^{-7} for residential and 1.65×10^{-7} for commercial receptors based on Tier II analysis. Tier II analysis was completed on assumption that landfill gas inlet will have 0.15 PPMV of all of Rule 1150.1 core toxics compounds in addition to HCHO emissions of 1.8 PPMV. Monitoring/lab records for this site were reviewed and all of the toxics were non-detectable with reporting limits less than 5 PPBV.

PAH's, & Napthalene emissions have not been included in rule 1401 analysis. Monitoring reports were reviewed for this site, PAH's, & Napthalene were not detected in the exhaust stream. Formaldehyde emissions were included in rule 1401 risk assessment.

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This facility has one more piece of equipment emitting exhaust, ICE running on landfill gas (A/N 444070). The MICR for ICE are 6.06×10^{-7} for residential and 5.43×10^{-8} for commercial receptors based on Tier II analysis.

RULES EVALUATION:

RULE 212: There are no schools within 1000 feet of emission source. Incremental health risk for the proposed modification is estimated to be less than one in a million. Based on the net emissions increase for various criteria pollutants, this is not considered a significant project and therefore a public notice is not required. Please see the table above. Compliance is expected, see table on page 4. For Rule 212(g) purposes, difference in old and new flare emissions was taken. There was no need to consider IC engine emissions as emissions calculations for both of the flares (existing and this one) have been completed with full gas generation potential of the landfill.

RULE 401: With proper operation and maintenance, equipment is expected to comply with this rule.

RULE 402: With proper operation, maintenance and monitoring of equipment, compliance is expected.

RULE 404: For proposed new flare, estimated PM (PM10) emission = 1.2 lbs/hr, 16,500 scfm, assumed dry exhaust flow

$$C = \frac{1.2 \text{ lb/hr} \times (7,000 \text{ grains/lb})}{16,500 \text{ dscfm} \times (60 \text{ min/hr})}$$

$$C = 0.008 \text{ grains/dscfm} < 0.067 \text{ grains/cu. ft for less than 16,500 dscfm}$$

Compliance with this rule is expected for this flare.

RULE 407: Estimated CO, ppmv = $2.73 \text{ lbs CO/hr} \times 379 \times 10^6 / (16,500 \text{ dscfm} \times 60 \times 28)$
= 37.3 ppmv, dry basis < 2000 ppmv rule limit.

RULE 409: Combustion contaminants emissions are expected to be < 0.1 grains/cubic feet of gas based on the existing permitted flare and other flares permitted in the SCAQMD region. Compliance is expected.

RULE 431.1: LFG for this facility has been well below allowable 150 ppmv H2S levels. Also, facility wide condition under Title V FP requires H2S concentration in LFG fuel to be less than 150 ppmv. Compliance is expected.

RULE 1150.1: The proposed low emission LAER flare is expected to comply with either non-methane organic compounds (NMOC) destruction efficiency of 98% by weight or is expected to reduce outlet NMOC concentration to less than 20 ppmv (as hexane), dry basis as hexane at 3%

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oxygen. This requirement will be determined by initial source test, and then conducting source test on an annual basis. Compliance is expected.

REG. XIII: BACT/LAER: The proposed enclosed flare is expected to meet all BACT/LAER requirements for LFG flare. John Zinc Corporation, flare manufacturer, has provided emissions guarantee letter (Copy in application package under BACT documentation section from John Zink, TP-B-0482, April 18, 2006, test performed at waste management of New Hampshire). Proposed flare will meet 0.025 lb NO_x /mmbtu, 0.06 lb CO/mmbtu emission limit, and DRE of 99%.

Rule 1303 Modeling: The emissions from the flare will exceed the limits in Table II for various criteria pollutants. A detailed modeling was conducted and analysis indicated that operation of the proposed flare will be in compliance with the requirements of the rule.

Pollutant	lb/hr	Screen - 3 - Conc. in micro gram/cubic meter (based on 1 lb/hr) at 1000 meter	Maximum 1-hour concentration based on Modeling Analysis
Nox	1.37	4.37	5.98
CO	1.64	4.37	7.16
PM-10	1.20	4.37	5.24

Emission Offsets: This is a municipal solids waste landfill operations facility, and is considered an Essential Public Service (ESP) per Rule 1302 Definitions, (m) (7). Therefore, required offsets will be provided from the Priority Reserve Account (Rule 1309.1).

Sensitive Zone Requirements: Not applicable as credits will be provided from the Priority Reserve.

Major Polluting Facility: Proposed flare will be located on the landfill adjacent to the existing flare. Low emission LAER flare is proposed to meet the current requirement. Enclosed flare is considered the standard commercial practice for LFG control and to comply with other rules. Therefore, no further alternative analysis is required.

Protection of Visibility: Not applicable. Moreno Valley is not near any of the specified Federal Class I area, and estimated NO_x and PM₁₀ net emissions increase are 14.34 TPY and 10.51 TPY, respectively (threshold limit >40 TPY NO_x and > 15 TPY PM₁₀ emissions.)

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Compliance through CEQA: Notice of Exemption dated 04-13-2010 was sent along with the application package. Riverside County Board of Supervisors adopted a Mitigated Negative Declaration for EA no. 39813 on May 24, 2005 for the current landfill operation. Please see attached document in the application package.

RULE 1401: As described under TAC emissions, risk due to incremental emissions is estimated to be less than one in a million, and HIC & HIA indices < 1 each. Compliance is expected.

RULE 1401.1: Not applicable. This is an existing facility.

RULE 1703 The facility is exempt from rule 1703 Requirements as it is an essential public service.

RULE 1714 The facility is exempt per rule 1714 requirements as per 1714 (d) as it is a not major source as per 40 CFR 52.21 (b) (1) and (b) (2). Please see the emissions table of criteria pollutants in this evaluation. Further the PTE of the equipment as CO2 equivalent tons is less than 56,000 tons per year.

Flare Scenario			
No. of Flares	1		
Amount of Landfill Gas Allowed to be Flared in Each Flare (SCFM)	2,000.00		
Total Landfill Gas Usage (SCFM)	2,000.00		
Methane % ge in landfill gas	45.50		
BTU/SCF of Methane Gas	1,000.00		
Calculated MMBtu/hr	54.60		
CO2 percentage in Landfill gas as per 2009 source test report	40.00		
Density of CH4 lb/cubic feet	0.04		
Density of CO2 lb/cubic feet	0.12		
Methane in the Landfill gas (SCFM)	910.00		
Destruction Efficiency % ge	99		
Metric Tons of Methane destroyed assuming 99% destruction in a year	9,093.44		
Metric Tons of CO2 generated from methane destroyed in flare in a year	25,006.96	Short Ton of CO2 Generated from Methane destroyed in a year	27,557.67
Metric Ton of CO2 eq of methane not Destroyed in flare in a Year	1,928.91	Short Ton of CO2e generated from methane not Destroyed in a Year	2,125.66
Metric Ton of CO2 in LFG	23,556.80	Short Ton of CO2 in LFG	25,959.60
		Total CO2 in short tons	55,642.92

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GHG PSD applicability based on the Tailoring rule:

Modified Source: Permit will be issued after July 1, 2011. The facility is an existing minor source of PSD. The CO₂ (equivalent) emissions from the total project < 75,000 TPY. Since LFG is the only source of fuel for this equipment, limiting amount of LFG flared will limit the GHG emissions from this equipment. Monitoring and recordkeeping conditions will also be imposed to ensure compliance. GHG gases are not subject to PSD as part of this review.

REG XXX: Replacement of existing flare is not expected to cause annual NO_x and ROG emissions increase to be greater than the threshold levels listed under Rule 3000 (b) (6) Table 1 (see below). Therefore, this is considered a De Minimis Significant Permit Revision per Rule 3000 (b) (28) (B) and subject to commenting period -EPA (45 days).

Air Contaminant	Daily Maximum (Pounds/day)
VOC	30
NO _x	40
SO _x	60
CO	220
PM-10	30

FEDERAL REGS: 40 CFR PART 60 SUBPART WWW AND AAAA:

Title 40 part 63 subpart AAAA - 63.1955 – If the landfill is operated in compliance with 40 CFR part 60 subpart WWW, it is in compliance with Title 40 part 63 subpart AAAA.

Title 40 part 60 subpart WWW - 60.752 - the site has a gas collection and control system installed in compliance with this subpart and is able to destroy NMOC by 98 percent or 20 PPMV by volume. The site is in Title V program and the applicant is aware of federal requirements for compliance with title 40 part 60 subpart WWW. Gas collection system is expected to be operated in accordance with the provisions of 60.753, 60.755, & 60.756.

Title 40 Part 64 - CAM not required until TV renewal.

CONCLUSION:

This equipment is expected to be in compliance with applicable SCAQMD Rules and Regulations.

RECOMMENDATION:

Issue a permit to construct, for the proposed modification after EPA commenting period.