

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

## **BACKGROUND**

Napa-Vallejo Waste Management Authority has made application for a Synthetic Minor Operating Permit under the provisions of Regulation 2, Rule 6-420 for its landfill located at American Canyon Sanitary Landfill, Napa, California. This site is a closed Class III municipal waste disposal site which began accepting municipal waste in 1966, last received solid waste in December 1994, and received final closure certification in December 2006. The current mass of the landfill is estimated to be approximately 4.23 million tons-in-place.

The landfill has an existing landfill gas collection and control system consisting of 87 landfill gas extraction wells with an associated landfill gas flare. The landfill gas collection system was originally installed in 1987, and was replaced by the current configuration in 2003. An initial Title V permit for the plant was issued in 2003 (Application #2631).

The bulk of the landfill gas collected by the landfill gas collection and control system is diverted to two internal combustion engines located at P #11671, Gas Recovery Systems, Inc (Fortistar Methane Group). These off-site sources burn the landfill gas for electricity generation, and act as the primary control devices for the landfill gas collection system. The on-site landfill gas flare is used in a standby capacity, and operates only when one or more of the primary control devices are inoperable.

The applicant believes that the landfill is no longer a major source of emissions. On August 21, 2008, the applicant submitted an application for a Synthetic Minor Operating Permit, pursuant to Regulation 2, Rule 6-310, in conjunction with its request to be removed from Title V designation.

## **SOURCES COVERED BY TITLE V OPERATING PERMIT**

Site # A9183 was issued an initial Title V operating permit on December 19, 2003, and this permit was revised on March 19, 2004 and June 17, 2004. The permitted equipment identified in the June 17, 2004 version of the Title V operating permit for this facility is listed below. There are no exempt sources at this facility.

S-1	American Canyon Sanitary Landfill equipped with Gas Collection System	Inactive Class III Solid Waste Disposal Site
A-2	Landfill Gas Flare	24 MM BTU/hour

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

**REQUIREMENTS FOR REMOVING A MUNICIPAL SOLID WASTE LANDFILL FROM TITLE V DESIGNATION**

In accordance with 40 CFR Part 60.752(d), a closed landfill is no longer subject to the Title V operating permit requirements if the landfill meets all of the gas collection and gas control system equipment removal criteria under 40 CFR Part 60.762(b)(2)(v). These criteria are:

- The landfill has been permanently closed (no longer actively accepting waste), and has submitted a closure report
- The landfill gas collection system has been in operation for at least 15 years, and
- Calculated NMOC gas produced by the landfill has been less than 50 Mg per year for three consecutive tests

Although a site has to meet these equipment removal criteria in order to be removed from the Title V permitting requirements, the site does not actually have to shut down and remove the gas collection and control system in order to be removed from Title V permitting requirements. Since sites may be required to operate gas collection and control systems pursuant to state or local air district requirements, a landfill may continue to operate its gas collection and control systems after the requirement to do so under federal regulations has ended. As long as the site continues to meet these equipment removal criteria, Title V permitting is not required.

**COMPLIANCE WITH REQUIREMENTS FOR REMOVAL FROM TITLE V DESIGNATION**

American Canyon Sanitary Landfill closed permanently in December 1994 (Attachment 1), and remains a closed landfill. It therefore meets the closure requirements of 40 CFR 60.752(b)(2)(v)(A).

This site was reportedly an open burn dump from 1942 to 1971. Sanitary landfill operation began in 1971, and continued until the end of 1995. The landfill was certified as closed in May of 2006 (Attachment 1).

A permit was issued for the landfill with a landfill gas collection and control system dated June 9, 1995 under Application #14355 (Attachment 2). This document is sufficient to demonstrate that the landfill has had a landfill gas collection and control system in place for at least 15 years.

The applicant performed approved Tier 2 landfill gas sampling and testing of the landfill gas emissions on January 16, 2007, January 15, 2008, and, January 13, 2009 following the procedures outlined in 40 CFR Part 60.754(b). The average of the last three source test results show that the average NMOC emission rate is approximately 5.1 Mg/year (Attachment 3). The landfill therefore meets the requirement that the calculated NMOC gas produced by the landfill be less than 50 Mg/year for three consecutive tests.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

## **EMISSIONS LIMITATIONS FOR MSW LANDFILL**

In order to be eligible for a synthetic minor permit, a site must either have a maximum potential to emit that is less than each Title V emission threshold (less than 95 tons/year of NO<sub>x</sub>, CO, POC, PM<sub>10</sub>, and SO<sub>2</sub>, less than 9 tons/year of any single hazardous air pollutant (HAP), and less than 23 tons/year of all HAPs combined) or must accept conditions limiting the site to less than these emissions thresholds (Regulation 2-6-423).

EPA has recently adopted Title V permitting thresholds for greenhouse gas (GHG) emissions that became effective for all sites on July 1, 2011. Any site that has the potential to emit more than 100,000 tons/year of greenhouse gases (expressed as CO<sub>2</sub> equivalent tons/year and including biogenic CO<sub>2</sub>) will be deemed a major facility and required to obtain a Title V permit. To be eligible for a Synthetic Minor Operating Permit for greenhouse gas emissions, the emission threshold is 90% of the Title V emission threshold, or 90,000 tons/year of CO<sub>2</sub> equivalent emissions, or must accept conditions limiting the site to less than these emissions thresholds (Regulation 2-6-423.2.2).

As shown by the following emissions calculations, this site does not have a potential to emit for any pollutant that exceeds any of the major facility emissions thresholds. Therefore, this site is no longer a major facility and may obtain a synthetic minor permit.

## **EMISSION CALCULATIONS**

All emissions from this closed landfill are either fugitive landfill gas from S-1 or collected landfill gas, abated by the A-2 Landfill Gas Flare. Landfills are not one of the 28 source categories for which fugitive emissions must be included in Title V potential to emit (PTE) determinations. Since the uncollected landfill gas emissions from S-1 are fugitive in nature, these emissions are not included in the site-wide PTE determination.

The only other source at this site is the A-2 landfill gas flare. The maximum heat input rate for A-2 is 24 MM BTU/hour. The PTE determination for this site is based on A-2 operating at 24 MM BTU/hour for 24 hours/day and 365 days/year (8,760 hours/year). The maximum annual heat input rate is 210,240 MM BTU/year. Maximum potential emissions were determined based on the emission limits and maximum emission factors specified in the original engineering evaluation for A-2 (NSR Application # 3286). These factors and the associated permit condition limits are discussed in more detail below.

Based on data reported in 2010, American Canyon Sanitary Landfill collected and burned 2,099 MSCF/year of landfill gas in A-2, and diverted 224,284 MSCF/year of landfill gas to Site # B1671; 1% of the collected landfill gas was burned in the on-site flare and 99% of the collected landfill gas was burned in off-site energy recovery devices. Based on the most recent source test

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

for the A-2 Flare, performed on January 13, 2009, the actual methane content in the landfill gas was 37.7% CH<sub>4</sub> and the heat content of the gas was 381 BTU/SCF. Using this data, the actual annual heat input rate to A-2 for the 2010 reporting year was: 799.719 MM BTU/year. Current 2011 emissions, reported below, were determined using this actual heat input rate and actual emission factors determined from source test data or other site-specific emission factor estimates.

For 2010, the landfill gas actually burned in the on-site A-2 Landfill Gas Flare (800 MM BTU/year) was less than 1% of the flare's maximum permitted capacity (210,240 MM BTU/year) and the total gas collected at this site (86,252 MM BTU/year) was only 41% of the maximum flare capacity. Since this landfill is closed and gas generation rates are declining, the gas collection rate is also expected to decline in the future. Therefore, maximum emissions from this site will be far less than the PTE reported below, even if all of the collected landfill gas is controlled by the on-site flare instead of the off-site engines.

The total site-wide potential to emit (PTE) and current emissions, excluding fugitive emissions, are summarized in Table 1 and compared to the synthetic minor permit limits. As shown in Table 1, the site-wide PTE is less than the Regulation 2-6-423 synthetic minor permit limits.

Total Site-Wide Non-Fugitive Emissions from Site # 9183

	Synthetic Minor Limit tons/year	Potential to Emit tons/year	Actual in 2011 tons/year
CO	95.0	21.02	0.002
NO <sub>x</sub>	95.0	6.31	0.016
SO <sub>2</sub>	95.0	5.98	0.005
PM <sub>10</sub>	95.0	6.31	0.007
POC	95.0	1.46	0.000
HAPs <sup>(1)</sup>	23.0 / 9.0	4.38	0.001
CO <sub>2</sub> e <sup>(2)</sup>	90,000	21,589	79

(1) Since the total HAP PTE is less than both the total HAP limit of 23.0 tons/year and the single HAP limit of 9.0 tons/year, a detailed list of individual HAP emissions is not necessary. The largest expected single HAP is hydrogen chloride (HCl) at 2.5 tons/year.

(2) Pursuant to Regulation 2-6-423.2.2, the greenhouse gas emissions Synthetic Minor permit limit is 90% of the Title V permit threshold, or 90,000 tons/year CO<sub>2</sub> equivalent emissions.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

**NO<sub>x</sub> and CO Emission Factors:**

In accordance with the Engineering Evaluation for Application # 3286, A-2 was subject to the following RACT limits: 0.06 pounds of NO<sub>x</sub> per MM BTU and 0.20 pounds of CO per MM BTU. The maximum permitted and maximum potential NO<sub>x</sub> and CO emission rates from A-2 are based on these RACT limits and continuous operation of A-2 at maximum capacity (210,240 MM BTU/year):

$$\begin{aligned} \text{CO} & \quad (210,240 \text{ MM BTU/year}) * (0.20 \text{ lbs/MM BTU}) / (2000 \text{ lbs/ton}) = 21.024 \text{ tons/year} \\ \text{NO}_x & \quad (210,240 \text{ MM BTU/year}) * (0.06 \text{ lbs/MM BTU}) / (2000 \text{ lbs/ton}) = 6.307 \text{ tons/year} \end{aligned}$$

The outlet NO<sub>x</sub> and CO concentration limits specified in Condition # 12418, Parts 9 and 10 were originally determined based on the RACT emission rates listed above and landfill gas containing 50% methane with a heat content of 500 BTU/scf and a flue gas generation rate of 4.796 scf (of flue gas at 0% excess oxygen) per scf of landfill gas. Source test data indicates that the landfill collected from this site typically contains 35%-40% methane, rather than 50% methane. To ensure compliance with the maximum permitted CO and NO<sub>x</sub> emission rates above, the District needs to adjust the outlet concentration limits to conform to the current landfill gas conditions. Landfill gas quality is expected to degrade in the future as the gas generation rate declines. As a worst case condition, the District will set the outlet concentration limits based on landfill gas containing 25% methane. However, the District will also add the RACT emission factors as alternative method to demonstrate compliance with these emission rates. The new outlet concentration limits are determined below based on landfill gas containing 25% methane with a heat content of 248.5 BTU/scf and a flue gas generation rate of 11,640 scf of flue gas at 0% excess oxygen per MM BTU.

$$\begin{aligned} \text{CO} & \quad (0.20 \text{ lbs/MM BTU}) / (28.01 \text{ lbs/lbmol}) * (387 \text{ scf/lbmol}) / (11,640 \text{ scf/MMBTU}) * \\ & \quad (20.9-3) / (20.9-0) * (1E6) = 203 \text{ ppmv of CO, corrected to 3\% O}_2, \text{ dry basis} \\ \text{NO}_x & \quad (0.06 \text{ lbs/MM BTU}) / (46.01 \text{ lbs/lbmol}) * (387 \text{ scf/lbmol}) / (11,640 \text{ scf/MMBTU}) * \\ & \quad (20.9-3) / (20.9-0) * (1E6) = 37 \text{ ppmv of NO}_x \text{ (as NO}_2\text{), corrected to 3\% O}_2, \text{ dry basis} \end{aligned}$$

Estimates of current CO and NO<sub>x</sub> emissions are based on the most recent source test for the landfill, performed on January 13, 2009. This source test measured average emissions of:

0.040 pounds of NO<sub>x</sub> per MM BTU (32.8 PPMV at 3% O<sub>2</sub>, dry) and  
<0.005 pounds of CO per MM BTU (4.3 ppmv at 3% O<sub>2</sub>, dry)

The actual methane content in the landfill gas was 37.7% CH<sub>4</sub>, which is equivalent to a heat content of 381 BTU/SCF.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

**SO<sub>2</sub> Emission Factors:**

Landfill gas contains a variety of sulfur compounds such as hydrogen sulfide, carbon disulfide, carbonyl sulfide, dimethyl sulfide, and ethyl and methyl mercaptans. The total concentration of sulfur compounds in landfill gas, or total reduced sulfur (TRS) content, is typically expressed as an equivalent concentration to hydrogen sulfide (H<sub>2</sub>S). When landfill gas is burned in A-2, the sulfur in these compounds is oxidized and forms sulfur dioxide (SO<sub>2</sub>). For SO<sub>2</sub> emission calculations, the District assumes that 100% of the inlet TRS will be converted to sulfur dioxide at a ratio of 1 mole of SO<sub>2</sub> formed per 1 mole of TRS (expressed as H<sub>2</sub>S) in landfill gas.

As discussed above for NO<sub>x</sub> and CO outlet concentrations, the relationship between the inlet landfill gas TRS content limit and the pounds/MM BTU SO<sub>2</sub> outlet emission rate is influenced by the methane concentration in the landfill gas. For any given pounds/MM BTU SO<sub>2</sub> emission rate, the equivalent inlet TRS concentration will be lower when the landfill gas methane concentration is lower and the equivalent inlet TRS concentration will be higher when the landfill gas methane concentration is higher.

From the Engineering Evaluation for Application # 3286, the Cumulative Emission Increase for A-2 was determined to be 5.982 tons/year of SO<sub>2</sub>, which is equivalent to 1.366 pounds/hour of SO<sub>2</sub> or 0.0569 pounds SO<sub>2</sub>/MM BTU. The Condition # 12418, Part 11 total reduced sulfur (TRS) content limit of 200 ppmv, expressed as H<sub>2</sub>S, was calculated based on landfill gas containing 50% methane with a heat content of 500 BTU/scf and a flue gas generation rate of 4.796 scf (of flue gas at 0% excess oxygen) per scf of landfill gas.

Recent tests indicate that landfill gas collected from this site now contains 35%-40% methane, instead of 50% methane. If the current TRS content limit of 200 ppmv is applied to landfill gas with 37.7% methane (the 2009 measured methane content), the equivalent SO<sub>2</sub> emission rate would be 0.088 lbs/MM BTU, which exceeds the SO<sub>2</sub> emission rate of 0.057 lbs /MM BTU that was approved under Application #3286. Therefore, in order to ensure that the cumulative emission increase of 5.982 tons/year of SO<sub>2</sub> is not exceeded under any possible landfill gas methane concentrations, the District needs to revise the current landfill gas sulfur content limit. For this landfill gas sulfur concentration determination, the landfill gas is assumed to contain a minimum of 25% methane (the expected worst case scenario) with a minimum heat content of 248.5 BTU/SCF and a flue gas generation rate of 11,640 scf of flue gas at 0% excess oxygen per MM BTU. Assuming all of the sulfur in the inlet landfill gas is converted to (SO<sub>2</sub>), the SO<sub>2</sub> emission rate of 0.0569 pounds of SO<sub>2</sub> per MM BTU is equal to an inlet TRS concentration of:

$$(0.0569 \text{ lbs SO}_2/\text{MM BTU}) / (64.06 \text{ lbs SO}_2/1 \text{ lbmol SO}_2) * (387 \text{ scf SO}_2/1 \text{ lbmol SO}_2) * (1 \text{ scf H}_2\text{S in}/1 \text{ scf SO}_2 \text{ out}) * (248.5 \text{ MM BTU/MM scf LFG}) = 85 \text{ scf H}_2\text{S} / \text{MM scf LFG} = 85 \text{ ppmv of TRS in LFG (expressed as H}_2\text{S)}$$

Thus, compliance with a landfill gas sulfur content limit 85 ppmv TRS (expressed as H<sub>2</sub>S) will ensure compliance with the cumulative emission increase limit of 5.982 tons/year of SO<sub>2</sub> for any

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

possible landfill gas methane concentrations (25%-60% CH<sub>4</sub> is the maximum landfill gas methane content range observed for landfills in the Bay Area).

Draeger tubes can be used to check the sulfur content in landfill gas, but this analysis method only measures hydrogen sulfide concentration and does not measure any of the total reduced sulfur compounds. Based on recent laboratory analyses on landfill gas collected from this site, the TRS concentration is more than 90% hydrogen sulfide (91% H<sub>2</sub>S in 2008 and 96% H<sub>2</sub>S in 2009). Therefore, if draeger tubes are used as a surrogate for monitoring the total reduced sulfur content, then the H<sub>2</sub>S limit should be 90% of the TRS limit (0.9\*85) or 76 ppmv of H<sub>2</sub>S in landfill gas.

The facility reported that the highest measured TRS value was 26 ppmv of H<sub>2</sub>S in 2009. Current actual SO<sub>2</sub> emissions are based on this maximum measured TRS content and the estimated landfill gas heat content of 381 BTU/SCF for 2009. The equivalent actual pounds of SO<sub>2</sub> per MM BTU emission rate determined below is less than 20% of the limit for A-2.

$$(26 \text{ ft}^3 \text{ TRS/MM ft}^3 \text{ LFG}) / (381 \text{ MM BTU/MM ft}^3 \text{ LFG}) / (387.006 \text{ ft}^3 \text{ TRS/1 lbmol TRS}) * (1 \text{ lbmol SO}_2 / 1 \text{ lbmol TRS}) * (64.059 \text{ lbs SO}_2 / 1 \text{ lbmol SO}_2) = 0.0113 \text{ lbs SO}_2 / \text{MM BTU}$$

**PM<sub>10</sub> Emission Factors:**

For Application #3286, the flare vendor indicated that PM<sub>10</sub> emissions would not exceed 30 pounds of PM<sub>10</sub> per million standard cubic feet of landfill gas burned. Based on landfill gas containing 50% methane with a heat content of 500 BTU/scf, the District determined that the equivalent emission rate was 0.06 lbs PM<sub>10</sub>/MM BTU and limited the cumulative emission increases for A-2 to 6.307 tons/year of PM<sub>10</sub>.

Actual PM<sub>10</sub> emissions from A-2 will be estimated using the AP-42 Chapter 2.4, Table 2.4-5 PM<sub>10</sub> emission rate from landfill gas fired flares (17 pounds per million cubic feet of methane burned), which is converted to pounds/MM BTU below:

$$(17 \text{ lbs PM}_{10} / 1 \text{ MM ft}^3 \text{ CH}_4) / (997.65 \text{ MM BTU} / 1 \text{ MM ft}^3 \text{ CH}_4) = 0.01704 \text{ lbs PM}_{10} / \text{MM BTU}$$

**POC Emission Factors:**

From the Engineering Evaluation for Application #3286, the maximum permitted POC emission rate for A-2 was determined to be 0.01392 lbs/MM BTU based on the Regulation 8-34-301.3 outlet NMOC concentration limit of 30 ppmv of NMOC (measured as methane) at 3% O<sub>2</sub>, dry basis. Although Regulation 8-34-301.3 also allows A-2 to meet a destruction efficiency limit of 98% NMOC control by weight, the low inlet NMOC content in landfill gas at this site would result in a lower emission factor if the destruction efficiency limit were applied to the inlet concentration than if the emission factor were based on the outlet NMOC concentration limit.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

For landfill gas at the minimum expected methane concentration (25% CH<sub>4</sub>), the Regulation 8-34-301.3 could allow up to 0.0169 pounds/MM BTU of POC emissions.

$$[30 \times (20.9/17.9) \text{ ft}^3 \text{ NMOC}/1\text{E}6 \text{ ft}^3 \text{ flue at } 0\% \text{ O}_2] \times (11,640 \text{ ft}^3 \text{ flue at } 0\% \text{ O}_2/\text{MM BTU}) / (387.006 \text{ ft}^3 \text{ NMOC}/1 \text{ lbmol NMOC}) \times (16.043 \text{ lbs NMOC}/1 \text{ lbmol NMOC}) = 0.0169 \text{ lbs NMOC/MM BTU} = 0.0169 \text{ lbs POC/MM BTU}$$

However, source test data indicates that A-2 has always operated well below this emission rate (typically non-detect for NMOC concentration at outlet and < 0.007 lbs NMOC/MM BTU for all tests). Therefore, the District does not believe A-2 could ever achieve this higher POC emission rate, and the maximum permitted POC emission factor of 0.01392 lbs/MM BTU will be used to determine the maximum potential to emit for A-2.

From the January 13, 2009 source test, the outlet NMOC concentration was not detected for any runs (<1 ppmv), and the emission rate was <0.0139 pounds/hour of NMOC and <0.00113 lbs NMOC/MM BTU. This NMOC detection rate (0.00113 lbs/MM BTU) will be used to estimate actual POC emissions.

**HAP Emission Factors:**

Landfill gas contains small quantities of numerous HAPs such as toluene, benzene, methylene chloride, and vinyl chloride. Landfill gas flares will have residual emissions of these HAPs. In addition landfill gas flares emit secondary HAPs such as formaldehyde, which results from the combustion of methane, and acid gases such as hydrogen chloride and hydrogen fluoride that result from the combustion of halogenated compounds. As a worst case assumption, all of the NMOC in the flare exhaust is assumed to be HAPs, and the maximum potential organic HAP emission factor is 0.01392 lbs/MM BTU from A-2.

For Application #3286, worst case emission rates for acid gases were determined based on AP-42 default concentrations for halogenated compounds and the assumption that all chloride and fluoride ions in landfill gas will be converted to HCl and HF, respectively. The AP-42 default concentrations result in a total of 126.9 ppmv of Cl ions and 37.4 ppmv of F ions. The maximum permitted acid gas emission rates for A-2 were calculated using these ion concentrations and an assumed landfill gas heat content of 500 BTU/scf.

$$(126.9 \text{ ft}^3 \text{ Cl}/\text{MM ft}^3 \text{ LFG}) / (500 \text{ MM BTU}/\text{MM ft}^3 \text{ LFG}) / (387.006 \text{ ft}^3 \text{ Cl}/\text{lbmol Cl}) \times (1 \text{ lbmol HCl}/1 \text{ lbmol Cl}) \times (36.461 \text{ lbs HCl}/\text{lbmol HCl}) = 0.02391 \text{ lbs HCl}/\text{MM BTU}$$

$$(37.4 \text{ ft}^3 \text{ F}/\text{MM ft}^3 \text{ LFG}) / (500 \text{ MM BTU}/\text{MM ft}^3 \text{ LFG}) / (387.006 \text{ ft}^3 \text{ F}/\text{lbmol F}) \times (1 \text{ lbmol HF}/1 \text{ lbmol F}) \times (20.006 \text{ lbs HF}/\text{lbmol HF}) = 0.00386 \text{ lbs HF}/\text{MM BTU}$$



**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

The total HAP emissions rate is the sum of the organic and acid gas HAPs, which is: 0.04169 lbs HAP/MM BTU.

Actual HAP emissions will be calculated in a similar manner (HAP = NMOC + HCl + HF), except that site specific data will be used instead of the maximum expected data. As discussed above for POC emission factors, actual NMOC = 1.13E-3 lbs/MM BTU. From the January 13, 2009 laboratory analysis, the landfill gas contained 2789 ppb of chloride ions and 1160 ppb of fluoride ions. The actual acid gas emission rates are determined below:

$$\begin{aligned} & (2789 \text{ ft}^3 \text{ Cl}/1\text{E}9 \text{ ft}^3 \text{ LFG})/(381 \text{ BTU}/1 \text{ ft}^3 \text{ LFG})*(1\text{E}6 \text{ BTU}/\text{MM BTU})/ \\ & (387.006 \text{ ft}^3 \text{ Cl}/\text{lbmol Cl})*(1 \text{ lbmol HCl}/1 \text{ lbmol Cl})*(36.461 \text{ lbs HCl}/\text{lbmol HCl}) \\ & = 6.9\text{E}-4 \text{ lbs HCl}/\text{MM BTU} \end{aligned}$$

$$\begin{aligned} & (1160 \text{ ft}^3 \text{ F}/1\text{E}9 \text{ ft}^3 \text{ LFG})/(381 \text{ BTU}/1 \text{ ft}^3 \text{ LFG})*(1\text{E}6 \text{ BTU}/\text{MM BTU})/ \\ & (387.006 \text{ ft}^3 \text{ F}/\text{lbmol F})*(1 \text{ lbmol HF}/1 \text{ lbmol F})*(20.006 \text{ lbs HF}/\text{lbmol HF}) \\ & = 1.6\text{E}-4 \text{ lbs HCl}/\text{MM BTU} \end{aligned}$$

The actual HAP emission factor is: 1.13E-3 + 6.9E-4 + 1.6E-4 = 1.98E-3 lbs/MM BTU.

**Greenhouse Gas Emission Factors:**

Greenhouse gases (GHGs) from the flare are expressed as tons per year of carbon dioxide equivalent (CO<sub>2</sub>e). The components of GHGs are biogenic carbon dioxide, methane, and nitrous oxide. Methane and nitrous oxide contributions are multiplied by the global warming potential weighting factors of 21 and 310, respectively, to obtain CO<sub>2</sub>e emissions. The District's general emission factors for landfill gas flares will be converted to units of lbs/MM BTU and used to determine the GHG PTE. These general factors assume that landfill gas contains 0.001% N<sub>2</sub>O, 55% CH<sub>4</sub>, 45% CO<sub>2</sub> and has a heat content of 546.638 BTU/SCF. The factors assume that 99% of the methane is converted to CO<sub>2</sub> by the flare and that 76.8% of the N<sub>2</sub>O is oxidized by the flare.

Default District GHG Factors for LFG Flares:      0.2280 lbs CH<sub>4</sub>/MSCF,  
   2.36E-4 lbs N<sub>2</sub>O/MSCF,  
   107.4073 lbs CO<sub>2</sub>/MSCF

$$\begin{aligned} \text{Total CO}_2\text{e} &= (0.2280*21) + (2.36\text{E}-4*310) + 107.4073 = 112.268 \text{ lbs}/\text{MSCF} \\ \text{Total CO}_2\text{e} &= (112.268 \text{ lbs}/\text{MSCF})/(1000 \text{ SCF}/\text{MSCF})/(546.638 \text{ BTU}/\text{SCF})* \\ & \quad (1\text{E}6 \text{ BTU}/\text{MM BTU}) \\ \text{Total CO}_2\text{e} &= 205.379 \text{ lbs}/\text{MM BTU} \end{aligned}$$

From the 2009 sources test, the inlet landfill gas to the flare contained 37.7% methane and 28.8% CO<sub>2</sub> with a heat content of 381 BTU/SCF. The outlet methane emission rate was <0.001

<p><b>SYNTHETIC MINOR OPERATING PERMIT EVALUATION REPORT NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY PLANT NUMBER A9183 APPLICATION NUMBER 18923</b></p>
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lbs/MM BTU (< 1 ppmv CH<sub>4</sub> at 3% O<sub>2</sub>, dry). If all of the methane was converted to CO<sub>2</sub> and combined with the CO<sub>2</sub> from the inlet gas, the actual outlet CO<sub>2</sub> emission rate would be:

$$\begin{aligned}
 & (0.288 \text{ ft}^3 \text{ CO}_2/\text{ft}^3 \text{ LFG}) + (0.377 \text{ ft}^3 \text{ CH}_4/\text{ft}^3 \text{ LFG}) * (1 \text{ ft}^3 \text{ CO}_2/1 \text{ ft}^3 \text{ CH}_4) \\
 & = 0.665 \text{ ft}^3 \text{ CO}_2/\text{ft}^3 \text{ LFG} \\
 & (0.665 \text{ ft}^3 \text{ CO}_2/\text{ft}^3 \text{ LFG}) / (381 \text{ BTU}/\text{ft}^3 \text{ LFG}) * (1\text{E}6 \text{ BTU}/\text{MM BTU}) / \\
 & (387.006 \text{ ft}^3 \text{ CO}_2/\text{lbmol CO}_2) * (44.0098 \text{ lbs CO}_2/\text{lbmol CO}_2) = 198.485 \text{ lbs CO}_2/\text{MM BTU}
 \end{aligned}$$

The total actual CO<sub>2</sub> equivalent emission rate from A-2 was:

$$(0.001 * 21) + 198.485 = 198.506 \text{ lbs CO}_2\text{e}/\text{MM BTU}$$

## STATEMENT OF COMPLIANCE

This facility is in compliance with the applicable requirements of Regulation 2 Rule 6 to obtain a synthetic minor permit. Napa-Vallejo Waste Management Authority has voluntarily accepted federally enforceable permit conditions including throughput limitations that will keep its potential to emit below the synthetic minor thresholds. The applicable District, State, and Federal rules are discussed below.

BAAQMD Regulation 6, Rule 1:

BAAQMD Regulation 6, Rule 1 applies to the A-2 Landfill Gas Flare. Section 305 prohibits visible emissions. Proper combustion of landfill gas will not result in any visible emissions. A-2 is expected to continue to comply with this requirement. Section 310 limits the grain loading in the exhaust to 0.15 grains/SDCF. The worst case grain loading from A-2 is determined below from the vendor specified emission factor for A-2 and the lowest expected theoretical flue gas factor of 9445 scdf flue gas/MM BTU, which applies to landfill gas containing 55% methane.

$$\begin{aligned}
 & (0.06 \text{ lbs PM}_{10}/1 \text{ MM BTU}) * (7000 \text{ grains PM}_{10}/1.0 \text{ lb PM}_{10}) / (9445 \text{ scdf flue gas}/\text{MM BTU}) \\
 & = 0.044 \text{ grains PM}_{10}/\text{SDCF of flue gas at 0\% O}_2
 \end{aligned}$$

The maximum potential emission rate from A-2 is 6.307 tons/year of PM<sub>10</sub>, and the maximum expected outlet grain loading is less than 30% of the limit. However, actual emissions are very low (0.007 tons/year of PM<sub>10</sub>). Even if all of the landfill gas that is currently burned off-site were diverted back to A-2, actual PM<sub>10</sub> emissions would be less than 1.0 tons/year of PM<sub>10</sub>. Since actual PM<sub>10</sub> emissions are low and there is a reasonable compliance margin (3:1 for the Regulation 6-310 limit versus the maximum permitted emission rate), it would not be appropriate to require expensive PM<sub>10</sub> emissions testing at A-2. Employing good combustion practices at A-2 should be sufficient to ensure that PM<sub>10</sub> emissions do not exceed the permitted rate. The existing continuous combustion zone temperature monitoring requirements and annual testing requirements for NO<sub>x</sub>, CO, and either SO<sub>2</sub> or landfill gas sulfur content will demonstrate that good combustion practices are being employed at A-2 on an on-going basis.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

BAAQMD Regulation 8, Rule 34:

BAAQMD Regulation 8, Rule 34 applies to this landfill because the landfill contains more than 1,000,000 tons of decomposable materials, and waste was last accepted at this landfill less than 30 years ago. The landfill is subject to Sections 301, 303, 304, and 305, and the flare is subject to Section 301.3.

Per Regulation 8-34-301.3, the flare is required to meet an NMOC outlet concentration limit of 30 ppmv of NMOC as C1 at 3% O<sub>2</sub>, dry basis or an NMOC destruction efficiency limit of 98% by weight. From the January 2009 source test, the measured NMOC outlet concentration was <1 ppmv at 3% O<sub>2</sub>, and A-2 was operating in compliance with Section 301.3.

Regulation 8-34-303 limits landfill surface leaks to no more than 500 ppmv as methane. The quarterly surface emissions monitoring demonstrates that this landfill is meeting this requirement. In accordance with Section 8-34-506, closed landfills may reduce this quarterly surface monitoring frequency to an annual basis, if no excesses of the limit have been detected in three consecutive quarters. Since no surface emission excesses have been detected in the last three quarters, annual surface monitoring for surface leaks is warranted, consistent with Regulation 8-34-506.1.3.

Regulation 8-34-304 establishes dates by which new gas collection systems must be operating. Since this landfill is closed and all areas have a gas collection system in place, there are no applicable installation requirements for this site. The gas collection system will be repaired and maintained as necessary to ensure proper operation.

Regulation 8-34-305 establishes wellhead limits for the landfill gas collection system components. All components will operate under negative pressure when the gas collection system is operating. No alternative wellhead standards have been approved for this site. The gas collection system components are expected to continue to comply with the wellhead temperature limit of 131 degrees F and the wellhead oxygen limit of 5% by volume. Regulation 8-34-505 requires monthly wellhead monitoring to demonstrate compliance with these wellhead standards.

BAAQMD Regulation 9, Rule 1:

Regulation 9-1-302 limits the SO<sub>2</sub> concentration in the flare exhaust to no more than 300 ppmvd. The proposed permit condition limits on SO<sub>2</sub> emissions, landfill gas total reduced sulfur content, or landfill gas hydrogen sulfide content will ensure that the outlet SO<sub>2</sub> concentration from A-2 does not exceed this limit. For the proposed landfill gas limit of 85 ppmv of TRS, the maximum outlet concentration will be 36 ppmv of SO<sub>2</sub>, which is only 12% of the limit. From the most recent source test, the actual TRS concentration was 26 ppmv, and the outlet concentration was calculated to be only 1 ppmv of SO<sub>2</sub>.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

Since the flare SO<sub>2</sub> emissions are not substantial, the maximum outlet SO<sub>2</sub> concentration is well below the limit, and the landfill gas sulfur content does not vary significantly at closed landfills, annual testing to demonstrate compliance with the TRS or H<sub>2</sub>S limits is sufficient to demonstrate compliance with the Regulation 9-1-302 standard. The site has also been given the option to directly test the flare for outlet SO<sub>2</sub> emissions on an annual basis to demonstrate compliance with this Regulation 9-1-302 limit and the cumulative emission increase of 5.982 tons/year of SO<sub>2</sub> (1.37 pounds/hour).

**CARB Regulations:**

A new state regulation that is intended to control greenhouse gas emissions, Methane Emissions from Municipal Solid Waste Landfills (CCR Title 17, Sections 95460-95476), applies to the landfill at this site because it accepted municipal solid waste after January 1, 1977 and none of the exemptions in Section 95462 are applicable. The current average heat input rate for landfill gas collected from this site is 12.4 MM BTU/hour, based on the most recent source test. Since this heat input rate exceeds 3.0 MM BTU/hour, this landfill is expected to be subject to the landfill gas collection and control requirements and all related limits, monitoring, and record keeping requirements.

The landfill will be required to operate the gas collection system continuously pursuant to Section 95464(b)(1)(A), except during maintenance, repairs, and temporary shutdowns as allowed pursuant to Section 95454(e).

Landfill gas collection system components upstream of the blower must be operated under vacuum (Section 95464(c)). Monthly wellhead monitoring is required (Section 95469(c)) to demonstrate compliance with this requirement.

Any landfill gas collection system components downstream of the blower that are intended to be operated under positive pressure have a component leak limit of 500 ppmv, measured as methane (Section 95464(b)(1)(B)). Section 95469 requires quarterly leak checks to demonstrate compliance with this limit.

The enclosed flare must meet the requirements in Section 95464(b)(2), including compliance with a methane destruction efficiency of at least 99% by weight. Compliance with this limit is demonstrated by annual source testing. The flare must also be operated within the temperature range established during the initial source test and this temperature and landfill gas flow rate must be monitored continuously per Section 95469(b)(1).

Section 95465 contains the two landfill surface emission standards: the instantaneous surface emission limit is 500 ppmv as methane; the integrated surface emission limit is 25 ppmv as methane for each grid. Section 95469(a) requires quarterly surface monitoring to demonstrate compliance with these standards. Since this landfill is closed, monitoring may be conducted on an annual basis instead, if no exceedances have been detected in four consecutive quarters.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

Many of the requirements in this CARB rule are the same as or similar to the existing requirements in the District rule. The new or more stringent limits are: 99% methane destruction at the flare, a 500 ppmv component leak limit instead of 1000 ppmv, and the 25 ppmv integrated surface emission standard. This closed landfill is expected to comply with these new requirements.

**Federal GHG Emissions Reporting Requirements:**

In accordance with 40 CFR Part 98.2 and Table A-3, GHG emissions reporting is required for MSW landfills that generate methane in amounts equivalent to 25,000 metric tons per year or more of CO<sub>2</sub>e. Based on the global warming potential of methane (21), this 25,000 metric tons/year CO<sub>2</sub>e threshold is equal to a methane generation rate of 1190.5 metric tons/year of methane generated (1312.3 short tons/year of CH<sub>4</sub> generated). According to the LANDGEM emissions modeling performed for this site, the methane generation rate in 2011 is 5704 metric tons/year (119,784 metric tons as CO<sub>2</sub>e). Therefore, this site is expected to be subject to these GHG emissions reporting requirements. GHG emissions must be reported for the landfill, as calculated pursuant to the procedures in 40 CFR Part 98, Subpart HH, and for the landfill gas flare, as calculated pursuant to the procedures in 40 CFR, Part 98, Subpart C.

**NEW SYNTHETIC MINOR OPERATING PERMIT CONDITIONS**

The new Synthetic Minor Operating Permit Condition will incorporate most of the District requirements as set out in the original Title V condition. Some condition provisions have been deleted as they are no longer required to demonstrate compliance with existing regulations. The new condition will add provisions to ensure that the facility will continue to meet the requirements set out in 40 CFR Part 60.752(d) to avoid designation as a Title V facility.

All existing permit conditions will be replaced with the following new synthetic minor permit conditions. Changes from the existing conditions are shown in strike-out and underline format.

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

Condition # 12418

SYNTHETIC MINOR OPERATING PERMIT

~~For: American Canyon Sanitary Landfill; and~~  
End of Eucalyptus Road, Napa, CA 94558  
Application #18923  
Plant #9183

Sources and Abatement Devices:

- S-1, American Canyon Sanitary Class III Landfill with Landfill Gas Collection System
- A-2, Landfill Gas Flare

This facility, Site # A9183, has a synthetic minor operating permit. This operating permit covers all equipment existing at this facility as of permit issuance. The sources and abatement devices are listed above.

The following conditions establish the federally enforceable permit terms that ensure this plant is classified as a Synthetic Minor Facility under District Regulation 2, Rule 6, Major Facility Review, and ensure it is not subject to the permitting requirements of Title V of the Federal Clean Air Act as amended in 1990 and 40 CFR Part 70. All applications submitted by the applicant and all modifications to the plant's equipment after issuance of the synthetic minor permit must be evaluated to ensure that the facility will not exceed the synthetic minor general limits below, and that sufficient monitoring, recordkeeping, and reporting requirements are imposed to ensure enforceability of the limits.

Any revision to a condition establishing this plant's status as a Synthetic Minor Facility or any new permit term that would limit emissions of a new or modified source for the purpose of maintaining the facility as a synthetic minor must undergo the procedures specified by Rule 2-6, section 423. The basis for the synthetic minor conditions is an emission limit of 95 tons per year for regulated air pollutants, of 90,000 tons per year for greenhouse gases (on a CO2 equivalent basis), an emission limit for a single hazardous air pollutant of 9 tons per year, and an emission limit for a combination of hazardous air pollutants of 23 tons per year.

Any District conditions that do not establish this facility as a synthetic minor are marked with an asterisk. The facility must comply with all conditions, regardless of asterisks, and must comply with all District requirements for new and modified sources regardless of its status as a synthetic minor.

**SYNTHETIC MINOR OPERATING PERMIT  
 EVALUATION REPORT  
 NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
 PLANT NUMBER A9183  
 APPLICATION NUMBER 18923**

1. In no event shall the emissions from this site exceed any of the emission limits listed below. The owner/operator shall demonstrate compliance with these emission limits by complying with all emission limits, monitoring procedures, and record keeping requirements identified in Parts 4-16 below. (Basis: Regulation 2-6-423)

NOx	95 tons/year
CO	95 tons/year
POC	95 tons/year
PM10	95 tons/year
SO2	95 tons/year
Any Single HAP	9 tons/year
Combination of HAPs	23 tons/year
CO2e	90,000 tons/year

12. The landfill at this facility is inactive closed. The Permit Holder shall apply for and receive a Change of Permit Condition before accepting any solid waste for disposal at S-4. The owner/operator shall not accept any solid waste at this landfill, shall not dispose of any waste materials at this landfill, and shall not re-use any waste materials in a manner consistent with disposal at the landfill. The total cumulative amount of all wastes placed in the landfill shall not exceed 4.23 million tons. The maximum design capacity of the landfill (total volume of all wastes and cover materials placed in the landfill, excluding final cover) shall not exceed 7 million cubic yards. (Basis: Regulation 2-1-301, 40 CFR Parts 60.752(d)(2) and 60.752(b)(2)(v)(A))

3. NMOC gas emissions from this landfill, as determined in accordance with 40 CFR Part 60.754(b), shall not exceed 50 Mg/year. To demonstrate compliance with this requirement, the owner/operator shall maintain records of the total amount of landfill gas collected from the landfill on an annual basis and shall maintain records of all NMOC concentration measurements made for the landfill gas collected from this site. (Basis: 40 CFR Parts 60.752(d)(2) and 60.752(b)(2)(v)(C))

24. The owner/operator shall ensure that all collected landfill gas shall be is vented to properly operating landfill gas control equipment (A-2 Landfill Gas Flare at Site # A9183, or S-2 and S-3 IC Engines at Site #B1671, or A-2 and S-2, or A-2 and S-3) the Landfill Gas Flare, A-2, and/or one or more of the two IC engines, S-2 and S-3, at Plant #11671. In the event that collected landfill gas exceeds the capacity of the IC Engines at Site #B1671, any excess gas collected shall be vented to the A-2 Landfill Gas Flare. In the event of a shutdown of one of the IC engines at Site #B1671, the collected landfill gas that exceeds the capacity of the remaining operational engine shall be automatically diverted to the A-2 Landfill Gas Flare. In the event of a shutdown of both of the IC engines at Site #B1671, all collected landfill gas shall be automatically diverted to the A-2 Landfill Gas Flare. The owner/operator shall ensure that raw landfill gas shall not be is not vented to the atmosphere, except for unavoidable landfill gas emissions that occur during collection system installation, maintenance, or repair, that which is performed in

**SYNTHETIC MINOR OPERATING PERMIT  
 EVALUATION REPORT  
 NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
 PLANT NUMBER A9183  
 APPLICATION NUMBER 18923**

compliance with Regulation 8, Rule 34, Sections 113, 117, or 118, and for inadvertent component or surface leaks that do not exceed the limits specified in Sections 8-34-301.2 or 8-34.303. (Basis: Regulation 8-34-301)

35. The American Canyon Sanitary Landfill shall be equipped with a landfill gas collection system. The owners/operator shall ensure that the landfill gas collection system, described in subpart 5a below, is ~~which shall be~~ operated continuously as defined in Regulation 8-34-219. Wells, collectors, and adjustment valves shall not be disconnected, removed, or completely closed, without prior written authorization from the District, unless the ~~Permit Holder~~ owner/operator complies with all applicable requirements of Regulation 8, Rule 34, Sections 113, 116, 117, and 118.

a. The ~~Permit Holder~~ owner/operator has been issued a Permit to Operate for the landfill gas collection system components listed below ~~as of October 23, 2006,~~ which includes all start-up/shut-down notifications submitted through September 18, 2011. Well and collector locations, depths, and lengths are as described in Permit Applications #8677, and #14817, and #23761. The owner/operator shall apply for and receive ~~an Authority to Construct a Change of Condition~~ from the District before altering the landfill gas collection system described below. . ~~Increasing or decreasing the number of wells or horizontal collectors are~~ Installing or decommissioning wells is considered an alteration ~~modifications that are which is~~ subject to this ~~Authority to Construct Change of Condition~~ requirement. Adding or modifying risers, laterals, or header pipes are not subject to this ~~Authority to Construct Change of Condition~~ requirement. The authorized number of landfill gas collection system components is the baseline count listed below, plus any components added and minus any components decommissioned pursuant to subpart 35b below, as evidenced by start-up/shut-down notification letters to the District.

Vertical Gas Extraction Wells:	56
Gas/Leachate Extraction Wells:	31
Total Landfill Gas Extraction Wells:	8

b. The ~~Permit Holder~~ owner/operator has been issued ~~an Authority to Construct a Change of Condition~~ for the additional landfill gas collection system component ~~modifications~~ alterations described below as of ~~October 23, 2006~~ September 18, 2011. Well and collector locations, depths, and lengths are as described in ~~Permit Applications #14817~~ the facility's Gas Collection and Control System Design Plan.

- Install up to ~~40~~ 25 new vertical wells
- Decommission up to ~~40~~ 25 vertical wells
- ~~— Install header valves, risers, and connections between existing horizontal collectors, as needed, to optimize gas collection and maintain compliance with Regulation 8, Rule 34~~
- Modify wellhead monitoring locations, as needed, provided that each landfill gas collection system component described in subpart 35a is adequately



**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

represented by a wellhead monitoring location. The ~~Permit Holder~~ owner/operator shall maintain adequate documentation on site that identifies all landfill gas collection system components that are represented by each wellhead monitoring location.

Wells installed, relocated, replaced, or shutdown pursuant to subpart 5b shall be added to or removed from subpart 5a in accordance with the procedures identified in Regulations 2-6-423.6. The owner/operator shall maintain records of the decommissioning date for each well that is shutdown and the initial operation date for each new or relocated well. (Basis: Regulations 2-1-301, 8-34-301.1, 8-34-304, 8-34-305, 2-6-423.6)

56. The A-2 Landfill Gas Flare shall be equipped with both local and remote alarm systems. (Basis: Regulation 8-34-301)
67. The A-2 Landfill Gas Flare shall be equipped with a flow meter and recorder meeting the requirements of Regulation 8-34-508. (Basis: Cumulative Increase, Regulations 8-34-301, 8-34-501.10, and 8-34-508)
78. The owner/operator shall ensure that the heat input to the A-2 Landfill Gas Flare shall does not exceed 576 million BTU per day and shall does not exceed 210,240 million BTU per year. In order to demonstrate compliance with this part, the owner/operator shall calculate and record, on a monthly basis, the maximum daily and total monthly heat input to the flare based on
- a. the landfill gas flow rate recorded pursuant to subpart 14a below,
  - b. the average methane concentration in the landfill gas based on the most recent source test, and
  - c. a high heating value of 1013 BTU per cubic foot of methane at 60 degrees F.
- (Basis: Cumulative Increase, Regulation 2-1-301)
89. The minimum combustion zone temperature for the flare shall be equal to the average combustion zone temperature determined during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F. The owner/operator shall ensure that the combustion zone temperature of the A-2 Landfill Gas Flare shall be is maintained at a minimum of 1400 degrees F, averaged over any three-hour period. If a source test demonstrates compliance with all applicable requirements at a different temperature, the APCO District may, upon request, revise this minimum temperature limit. in accordance with the procedures identified in Regulation 2-6-414 or 2-6-415, based on the following criteria. In no case will the minimum combustion zone temperature for A-2 shall be less than equal to the average combustion zone temperature determined during the most recent complying source test minus 50 degrees F, provided that the minimum combustion zone temperature is not less than 1400 degrees F. (Basis: Toxic Risk Management Policy and Regulations 2-5-301, 8-34-301.3)

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

910. The owner/operator shall ensure that nitrogen oxide (NO<sub>x</sub>) emissions from the A-2 Landfill Gas Flare do not exceed ~~45~~ 37 ppmv NO<sub>x</sub>, expressed as NO<sub>2</sub> and corrected to 3% O<sub>2</sub>, dry basis, unless the owner/operator demonstrates that NO<sub>x</sub> emissions from A-2, calculated as NO<sub>2</sub>, do not exceed 0.06 pounds per MM BTU. (Basis: RACT and Cumulative Increase)
1011. The owner/operator shall ensure that carbon monoxide (CO) emissions from the A-2 Landfill Gas Flare do not exceed ~~247~~ 203 ppmv, corrected to 3% O<sub>2</sub>, dry, unless the owner/operator demonstrates that CO emissions from A-2 do not exceed 0.20 pounds per MM BTU. (Basis: RACT and Cumulative Increase)
1112. The concentration of total reduced sulfur compounds in the collected landfill gas shall not exceed 200 ppmv (dry), expressed as hydrogen sulfide (H<sub>2</sub>S). The owner/operate shall comply with one of the following sulfur related limits and the associated monitoring procedure to demonstrate compliance with sulfur dioxide emission limitations for A-2.
- a. Sulfur dioxide emissions in the exhaust from the A-2 Landfill Gas Flare shall not exceed 1.37 pounds per hour and the sulfur dioxide concentration in the exhaust from A-2 shall not exceed the Regulation 9-1-302 limit (300 ppmv, dry basis). To demonstrate compliance with this subpart, the owner/operator shall comply with the annual source testing requirements in Part 14e.
- b. The concentration of total reduced sulfur compounds (TRS), expressed as hydrogen sulfide (H<sub>2</sub>S), in the landfill gas collected from S-1 shall not exceed 85 ppmv of TRS, expressed as H<sub>2</sub>S, dry basis. To demonstrate compliance with this subpart, the owner/operator shall comply with the annual landfill gas laboratory analysis procedures in Part 15.
- c. The average concentration of hydrogen sulfide in collected landfill shall not exceed 76 ppmv of H<sub>2</sub>S. To demonstrate compliance with this subpart, the owner/operator shall collect and test samples of landfill gas on an annual basis in accordance with the following procedures. All testing shall be conducted no later than 12 months after the previous test. Landfill gas samples shall be collected at the inlet to the landfill gas flare. For each annual test, the owner/operator shall collect three samples of landfill gas and shall test each sample for hydrogen sulfide concentration (ppmv of H<sub>2</sub>S) using a draeger tube. The owner/operator shall follow the manufacturer's instructions for using the draeger tube and interpreting the results. The owner/operator shall maintain records of the test date, the H<sub>2</sub>S concentration for each sample, and the average H<sub>2</sub>S concentration for each annual test. This average H<sub>2</sub>S concentration shall be compared to the limit above to assess compliance with this subpart.
- (Basis: Cumulative Increase and Regulation 9-1-302)
- \*1213. The ~~Permit Holder~~ owner/operator shall submit a permit application for a change of permit conditions if any site-specific landfill gas characterization test indicates that the landfill gas at this site contains any of the following compounds at a level greater than the

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

concentration listed below, ~~or if any source test indicates that formaldehyde emissions from the A-2 Landfill Gas Flare exceed 0.4 pounds per day.~~ The permit application shall be submitted to the Permit Services Division within 45 days of receipt of test results indicating a concentration or emission rate above the levels listed in this part. (Basis: ~~Toxic Risk Management Policy Regulation 2-5-302,~~ and AB-2588 Air Toxics Hot Spots Act)

<u>Compound</u>	<u>Concentration (ppbv)</u>
Acrylonitrile	12000
Benzene	4000
Carbon tetrachloride	100
Chloroform	500
1,4-Dichlorobenzene	3500
Ethylene dibromide	100
Ethylene dichloride	1000
Ethylidene dichloride	5000
Methylene chloride	28000
Perchloroethylene	7500
1,1,2,2-Tetrachloroethane	2000
Trichloroethylene	5500
Vinyl chloride	14500

1314. In order to demonstrate compliance with Regulation 2-1-301 and Regulation 8, Rule 34, Sections 301.3 and 412, ~~and Parts 7-12 above,~~ the ~~Permit Holder~~ owner/operator shall ensure that a District-approved source test is conducted annually on ~~the A-2 Landfill Gas Flare (A-2).~~ At a minimum, the annual source test shall determine the following:
- a. landfill gas flow rate to the flare (dry basis);
  - b. concentrations (dry basis) of carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), oxygen (O<sub>2</sub>), ~~total hydrocarbons (THC),~~ methane (CH<sub>4</sub>), and total non-methane organic compounds (NMOC) in the landfill gas;
  - c. stack gas flow rate from the flare (dry basis);
  - d. concentrations (dry basis) of NO<sub>x</sub>, CO, CH<sub>4</sub>, NMOC, and O<sub>2</sub> in the flare stack gas;
  - e. concentration (dry basis) of SO<sub>2</sub> in the flare stack gas and the pounds per hour SO<sub>2</sub> emission rate from the flare, if using Part 12a to demonstrate compliance with Part 12;
  - ef. CH<sub>4</sub> and NMOC destruction efficiencies achieved by the flare; and
  - fg. average combustion zone temperature of the A-2 Landfill Gas Flare during the test period, ~~;~~ and
  - g. ~~emission rates (in pounds per hour) of benzene, formaldehyde, and vinyl chloride from the Landfill Gas Flare (once every four years).~~

**SYNTHETIC MINOR OPERATING PERMIT  
 EVALUATION REPORT  
 NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
 PLANT NUMBER A9183  
 APPLICATION NUMBER 18923**

Annual source tests shall be conducted ~~no sooner than nine months and~~ no later than twelve months after the previous source test. The owner/operator shall obtain approval from the District's Source Test Section for all source testing procedures. Source Test Section of the District shall be contacted to obtain approval of the source test procedures at least 14 days in advance of each source test. The Source Test Section shall be notified of the scheduled test date at least 7 days in advance of each source test. The source test shall be submitted to the Compliance and Enforcement Division and the Source Test Section within 60 days of the test date. Within 60 days of test completion a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition.

(Basis: RACT, Cumulative Increase, ~~Toxic Risk Management Policy, and Regulations 2-1-301, 2-5-302, 8-34-301.3, 8-34-412, 8-34-413~~)

1415. In order to demonstrate compliance with parts ~~11-12~~ 10-13 above and Regulations ~~8-34-412 and~~ 9-1-302, the ~~Permit Holder~~ owner/operator shall conduct a characterization of the landfill gas concurrent with the annual source test required by part ~~13~~14 above. The landfill gas sample shall be drawn from the main landfill gas header. In addition to the compounds listed in Part ~~13~~14b, the landfill gas shall be analyzed for all the organic ~~and sulfur~~ compounds listed below. If using Part 12b to demonstrate compliance with Part 12, the landfill gas shall also be analyzed for all of the sulfur compounds listed below. All concentrations shall be reported on a dry basis. The test report shall be submitted to the Compliance and Enforcement Division within 60 days of the test date. Within 60 days of test completion a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition. After conducting three annual landfill gas characterization tests, the owner/operator may request removal of specific compounds from the list of compounds to be tested for if the compounds have not been detected, have no significant impact on the cancer risk determination for the site, and have no significant impact on the hazard index determination for the site. (Basis: ~~Toxic Risk Management Policy, AB-2588 Air Toxics Hot Spots Act, Cumulative Increase, Regulations 2-5-302, 8-34-413, 9-1-302~~)

Organic Compounds  
 acrylonitrile  
 benzene  
 carbon tetrachloride  
 chlorobenzene  
~~chlorodifluoromethane~~  
 chloroethane  
 chloroform  
 1,1 dichloroethane  
 1,1 dichloroethene  
 1,2 dichloroethane  
 1,4 dichlorobenzene

Organic Compounds  
 ethylene dibromide  
~~fluorotrichloromethane~~  
 hexane  
 isopropyl alcohol  
 methyl ethyl ketone  
 methylene chloride  
 perchloroethylene  
 toluene  
 1,1,1 trichloroethane  
 1,1,2,2 tetrachloroethane  
 trichloroethylene

**SYNTHETIC MINOR OPERATING PERMIT  
 EVALUATION REPORT  
 NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
 PLANT NUMBER A9183  
 APPLICATION NUMBER 18923**

~~dichlorodifluoromethane~~  
~~dichlorofluoromethane~~  
 ethyl benzene

vinyl chloride  
 xylenes

Sulfur Compounds  
 carbon disulfide  
 carbonyl sulfide  
 dimethyl sulfide  
 ethyl mercaptan  
 hydrogen sulfide  
 methyl mercaptan

1516. In order to demonstrate compliance with the above conditions, the owner/operator shall maintain the following records in a District-approved logbook:
- a. Record the initial operation date for each new landfill gas well and collector.
  - b. Maintain an accurate map of the landfill, which indicates the locations of all refuse boundaries and the locations of all wells and collectors (using unique identifiers) that are required to be operating continuously pursuant to subpart 35a above. Any areas containing only non-decomposable waste shall be clearly identified. This map shall be updated at least once a year to include any newly installed wells and collectors.
  - c. Record on a daily basis the operating times and the landfill gas flow rate to the A-2 Landfill Gas Flare. Summarize these records on a monthly basis.
  - d. Calculate and record on a monthly basis the maximum daily and total monthly heat input to the A-2 Landfill Gas Flare based on the landfill gas flow rate recorded pursuant to part 67 above, the average methane concentration in the landfill gas as determined by the most recent source test, and a high heating value for methane of 1013 BTU/ft<sup>3</sup> of landfill gas at 60 degrees F.
  - e. Maintain continuous records of the combustion zone temperature for the A-2 Landfill Gas Flare during all hours of operation.
  - f. Maintain records of all test dates and test results performed to maintain compliance with parts 12 and 13, 14, and 15 above, or to maintain compliance with any applicable rule or regulation.

All records shall be maintained on site or shall be made readily available to District staff upon request for a period of at least five years from the date of entry. These recordkeeping requirements do not replace any recordkeeping requirements contained in any other applicable rule or regulation.

(Basis: Cumulative Increase, Regulations 2-1-301, 2-6-501, 8-34-301, 8-34-303, 8-34-304, 8-34-501, and 9-1-302)

- ~~16. The annual report required by BAAQMD Regulation 8-34-411 shall be submitted in two semi-annual increments. The reporting period for the first increment of the regulation 8-34-411 annual report that is submitted subsequently to the issuance of the MFR Permit~~

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

~~for this site shall be from December 1, 2003 through May 31, 2004. This first increment report shall be submitted by June 30, 2004. The reporting periods and report submittal due dates for all subsequent increments of the Regulation 8-34-411 report and for all semi-annual increments of MSW Landfill NESHAP report (required pursuant to 40 CFR Part 63.1980(a)) shall be synchronized with the reporting periods and report submittal due dates for the semi-annual MFR Permit monitoring reports that are required by Section I. F of the MFR Permit for this site. A single report may be submitted to satisfy the requirements of Section I. F, Regulation 8-34-411, and 40 CFR Part 63.1980(a), provided that all items required by each applicable reporting requirement are included in the single report. (Basis: Regulations 8-34-411, 8-34-501, 8-34-503, 8-34-505, 8-34-506, 8-34-507, 8-34-508, 8-34-509)~~

*End of Conditions*

The reasons for the proposed permit condition changes are discussed below:

- The District is adding standard language to Condition #12418 to explain that this is a synthetic minor operating permit.
- In Part 1, the District is adding the standard emission limits for synthetic minor operating permits. All subsequent parts were renumbered.
- In Part 2, the District is clarifying the closure status of the landfill and is adding the citations to the basis that indicate why Title V is not applicable to this site.
- The District is adding Part 3. Part 3 is necessary to ensure that the landfill continues to satisfy one of the Title V non-applicability criteria.
- Part 4 describes the currently approved landfill gas control devices and the operating requirements for the landfill gas control system. It also prohibits the landfill from bypassing this control system. Currently, the on-site flare must operate whenever one or more of the off-site engines are not operating. The District is revising this control system operating requirement. The maximum heat input capacities for the control devices are: 24 MM BTU/hour for the on-site flare and 8.12 MM BTU/hour for each of the two off-site engines (16.24 MM BTU/hour for the two engines combined). The average heat input rate of the collected gas was 9.85 MM BTU/hour in 2009, and the landfill gas collection rate has been declining by about 3% per year due to the decreasing gas generation rate at this closed landfill. Typically, the two off-site engines run concurrently, and the two engines have sufficient capacity to control all of the gas collected from this site. A few times per year, only a single engine is operated at a time while maintenance is conducted on the other engine. These engine maintenance events typically last less than two weeks at a time. During operation of a single off-site engine, the engine has the capacity to handle 88% of the gas that is currently expected to be collected from this landfill. This collection rate (8.1 MM BTU/hour) should be adequate to prevent surface emission leaks from the landfill during the short durations of the engine maintenance events. By 2015, the gas collection rate will have declined enough

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

such that a single off-site engine will have sufficient heat input capacity to control all of the gas that could be collected from the landfill. Therefore, it is not necessary for the on-site flare to operate when only one off-site engine is operating, and the District is removing this restriction from Part 4.

- Part 5 describes the landfill gas collection system and operating requirements. The District is revising the text in this part to make it consistent with other landfill facilities. In addition, the District is including well changes that are expected to be approved pursuant to Application # 23761 prior to issuance of this SMOP.
- Part 8 limits the heat input rates to the A-2 Landfill Gas Flare. The District is adding calculation procedures and record keeping requirements to verify compliance with these heat input limits.
- For Part 9, the District is making editorial revisions to improve the clarity and consistency of this part.
- Parts 10 and 11 limit the NO<sub>x</sub> and CO emissions from A-2. At the lower landfill gas methane concentrations that have been recently reported for this site, the current concentration limits alone could allow higher NO<sub>x</sub> or CO emission rates than the cumulative emission increase amounts that were charged to this site during the initial permitting of A-2. The District is reducing the existing outlet NO<sub>x</sub> and CO concentration limits from A-2 to ensure that NO<sub>x</sub> and CO emissions from A-2 will not exceed the original permitted emission rates. The District is also adding the equivalent pounds per MM BTU emission rates for these pollutants and is indicating that the pound/MM BTU emission rate is the primary limit. Thus, a violation would not occur if A-2 is complying with the pound/MM BTU NO<sub>x</sub> emission rate limit, even if the outlet NO<sub>x</sub> concentration is exceeding the concentration limit in Part 10.
- For Part 12, the District is adding the Regulation 9-1-302 sulfur dioxide outlet concentration standard to the current inlet TRS concentration limit, which was imposed to ensure compliance with SO<sub>2</sub> cumulative emission increases for this site. To provide monitoring flexibility for this site, the District is clearly identifying three alternative sulfur related limits that will each ensure compliance with the two applicable sulfur dioxide requirements (Cumulative Increases and Regulation 9-1-302). Each alternative limit requires a different testing procedure, but the monitoring frequency is the same for all alternative limits: testing on an annual basis.
- In Parts 13 and 14, the District is deleting the formaldehyde emission limit for A-2 and the testing requirements for formaldehyde and residual TACs from A-2. The District has found that formaldehyde emissions testing on small landfill gas flares located at closed landfills is often not useful because formaldehyde is rarely detected in the exhaust gas samples. Furthermore, the District has determined that, even at maximum capacity, the formaldehyde emissions from A-2 and the expected residual TAC emissions from A-2 result in health risks that are well below the project risk limits in Regulation 2-5-302. Therefore, the formaldehyde emission limit for A-2 and the related TAC testing requirements for A-2 are not necessary. The District is also correcting the bases for these parts because the District's Toxic Risk Management Policy was replaced by Regulation 2, Rule 5 in 2005. The remaining landfill gas TAC concentration limits in Part 13 will

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
NAPA-VALLEJO WASTE MANAGEMENT AUTHORITY  
PLANT NUMBER A9183  
APPLICATION NUMBER 18923**

ensure that the health risks resulting from landfill emissions do not exceed any of the notification thresholds of the Air Toxic Hot Spots Act. The District is making other revisions to Part 14 to ensure consistency with current applicable requirements and to improve clarity.

- In Part 15, the District is making editorial revisions pursuant to regulatory changes and to ensure consistency with other parts.
- In Part 16, the District is adding and clarifying record keeping requirements, which are needed to verify compliance with this permit condition.
- The District is deleting the annual report provisions (former Part 16) because the semi-annual reporting provisions only apply to sites with Title V permits.

**RECOMMENDATION**

The District is proposing to issue a Change of Permit Conditions and a Synthetic Minor Operating Permit to Site #A9183. In accordance with SIP Regulation 2-6-423.3, this preliminary decision is subject to a 30 day public comment period. At the conclusion of the comment period, the District will make a final decision on this matter after considering any comments received.

By: \_\_\_\_\_  
Catherine S. Fortney  
Air Quality Engineer II

Date: \_\_\_\_\_