Bay Area Air Quality Management District

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

Permit Evaluation
and
Statement of Basis
for
MAJOR FACILITY REVIEW PERMIT

for

City of Palo Alto Landfill
Facility #A2721

Facility Address:
2380 Embarcadero Road
Palo Alto, CA 94303

Mailing Address:
P. O. Box 10250
Palo Alto, CA 94303

TABLE OF CONTENTS

A. Background 3

B. Facility Description 3

C. Permit Content 5

I. Standard Conditions 5

II. Equipment 5

III. Generally Applicable Requirements 6

IV. Source-Specific Applicable Requirements 6

V. Schedule of Compliance 8

VI. Permit Conditions 9

VII. Applicable Limits and Compliance Monitoring Requirements 16

VIII. Test Methods 25

IX. Permit Shield: 25

D. Alternate Operating Scenario: 26

E. Compliance Status: 26

F. Differences Between the Application and the Proposed Permit: 26

Title V Statement of Basis

A. Background

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Volume 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a designated facility as defined by BAAQMD Regulation 2-6-204. The Emission Guidelines for Municipal Solid Waste Landfills (40 CFR Part 60, Subpart Cc) require the owner or operator of a landfill that is subject to this part and that has a design capacity of greater than or equal to 2.5 million megagrams and 2.5 million cubic meters to obtain an operating permit pursuant to Part 70. As discussed in more detail below in Section C.IV. of this report, this facility is subject to these emission guidelines and meets the designated facility criteria listed in 40 CFR § 60.32c(c).

Major Facility Operating permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6. The permits must contain all applicable requirements (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. These requirements can be federally enforceable or non-federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility identifier that consists of a letter and a 4-digit number. This identifier is also considered to be the identifier for the permit.

B. Facility Description

The City of Palo Alto (Facility # A2721) is located in Byxbee Park, CA and is owned and operated by the City of Palo Alto. The facility includes an active municipal solid waste landfill, an active landfill gas collection, a landfill gas control system, and composting operations.

The landfill is a 63-year old waste disposal site with approximately 137 acres of the site permitted for waste disposal. About 76 acres of the landfill have been closed in accordance with Title 27 requirements. The landfill is designed to accept primarily non-hazardous wastes including household wastes, commercial wastes, agricultural wastes, industrial wastes, construction and demolition wastes, and contaminated soils whose VOC concentrations does not exceed 50 ppm. The landfill has a maximum design capacity of 7.76 million yd^3 (5.93 million m^3) and 5.83 million tons (5.29 million Mg), and currently contains approximately 4.58 million tons (4.15 million Mg). Since the design capacity of this landfill exceeds the 40 CFR § 60.32c(c) applicability criteria, a Title V Permit is required for this facility.

The MFR Permit covers all equipment operated by the City of Palo Alto at Byxbee Park. Specifically, this permit includes the following permitted equipment:

S-1 Palo Alto Landfill with Gas Collection System
A-3 Landfill Gas Flare
S-5 Wood Grinder
S-6 Diesel Engine (860 bhp, driver for S-5)
S-7 Trommel Screen
S-8 Diesel Engine (96 bhp, driver for S-7)
A-5 Water Sprays (abating S-5 and S-7)

At the landfill, the waste decomposition process generates landfill gas, which contains mainly methane, carbon dioxide, and small amounts of non-methane organic compounds (<1%) and sulfur compounds (<400 ppmv). Many of the non-methane organic compounds (NMOCs) found in landfill gas are precursor organic compounds (POC), and some NMOCs are hazardous air pollutants (HAP). Various local, state, and federal regulations require that landfill gas be collected and controlled to reduce POC and HAP emissions to the atmosphere. In order to meet these requirements, the landfill at this site is equipped with an active landfill gas collection system and a landfill gas control system.

Active landfill gas collection systems consist of perforated pipes that are buried in the refuse at numerous locations, solid pipes referred to as laterals and headers, and blowers. The perforated pipes are called horizontal collectors or vertical wells, depending on the orientation of the pipes within the refuse. The gas collection system at this site includes 92 vertical wells. There are no horizontal collectors. The solid pipes connect the perforated pipes to the blowers. The blowers collect landfill gas by creating a vacuum in the buried refuse that draws landfill gas into the pipes. The blowers vent this collected landfill gas to the landfill gas control system.

The on-site landfill gas control system for this landfill consists of the A-3 Landfill Gas Flare. The flare destroys most of the methane, organic compounds, sulfur compounds and HAPS in the landfill gas but also produces secondary combustion pollutants including: Nitrogen Oxides (NO_X), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Particulate Matter (PM_{10}), Formaldehyde and Hydrogen Chloride.

In addition, landfill gas may be sold and used off-site at a nearby facility (WPI Packaging and Maintenance Company, Inc., Facility # A9794). At this site, landfill gas is used as fuel in two lean burn internal combustion engines (S-1 and S-2). These landfill gas fired engines are owned and operated by a separate company from the City of Palo Alto's operations. Therefore, these landfill gas fired engines have not been included in this MFR Permit. Since the emissions from Facility # A9794 do not exceed the MFR review applicability thresholds, a Title V Permit is not required for Facility # A9794.

The S-5 Wood Grinder and S-7 Trommel Screen emit particulate matter. The A-5 Water Sprays control the particulate emissions from S-5 and S-7. The S-6 and S-8 Diesel Engines provide power for S-5 and S-7. These diesel engines produce combustion emissions including: NO_x, CO, POC, SO_2, and PM_{10}.

C. Permit Content

The legal and factual basis for the permit follows. The permit sections are described in the order presented in the permit.

I. Standard Conditions

This section contains administrative requirements and conditions that apply to all facilities. If the Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or the accidental release (40 CFR § 68) programs apply, the section will contain a standard condition pertaining to these programs. Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1 and Regulation 2. These are the District's General Provisions and Permitting rules.

Condition I.J has been added to clarify that the capacity limits shown in Table II-A are enforceable limits.

II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S1).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302.

Significant sources are those sources that have a potential to emit of more than 2 tons of a "regulated air pollutant," as defined in BAAQMD Rule 2-6-222, per year or 400 pounds of a "hazardous air pollutant," as defined in BAAQMD Rule 2-6-210, per year. This facility has no significant unpermitted sources.

All abatement (control) devices that control permitted or significant sources are listed. Each abatement device whose primary function is to reduce emissions is identified by an A and a number (e.g., A-3).

The equipment section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types, contents or sizes of tanks, etc. This information is part of the factual basis of the permit.

Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District's regulations. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition and Regulation 2-1-403.

The equipment list for this Title V Application has changed since the application was filed on June 20, 2001. These changes were due to removal of equipment that has been shut down, addition of new permitted equipment, and revisions to permit descriptions as follows:

1. An existing wood grinder (S-4) that was listed in the original application and the associated diesel engine driver (which was not listed or permitted) have been shut down and have been removed from list of permitted equipment for this facility.

2. The S-5 Wood Grinder that replaced S-4 was permitted in April 2003 and has been added to the list of permitted equipment for this facility.

3. The 860 HP diesel engine driver (S-6) for the new wood grinder was permitted in April 2003 and has been added to the list of permitted equipment for this facility.

4. The S-7 Trommel Screen was permitted in April 2003 and has been added to the list of permitted equipment for this facility.

5. The 96 HP diesel engine driver (S-8) for the trommel screen was permitted in April 2003 and has been added to the list of permitted equipment for this facility.

6. The flare was previously designated as source S-3. The flare is currently considered to be an abatement device (A-3). The permitted equipment list has been modified to reflect this change.

III. Generally Applicable Requirements

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, standards that apply to insignificant or unpermitted sources at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound) are placed in this section.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered significant sources pursuant to the definition in BAAQMD Rule 2-6-239. This facility does not have any significant sources that do not have District Permits to Operate.

IV. Source-Specific Applicable Requirements

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

- District Rules and Regulations
- SIP Rules (if any) are listed following the corresponding District rules. SIP rules are District rules that have been approved by EPA for inclusion in the California State Implementation Plan. SIP rules are "federally enforceable" and a "Y" (yes) indication will appear in the "Federally Enforceable" column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the "Federally Enforceable" column will have a "Y" for "yes". If the SIP rule is not the current District rule, the SIP rule or the necessary portion of the SIP rule is cited separately after the District rule. The SIP portion will be federally enforceable; the non-SIP version will not be federally enforceable, unless EPA has approved it through another program.
- Other District requirements, such as the Manual of Procedures, as appropriate.
- Federal requirements (other than SIP provisions)
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.
- Federal permits conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations to all of the applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District's or EPA's websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

Complex Applicability Determinations

Landfills and landfill gas combustion equipment are subject to BAAQMD Regulation 8, Rule 34. This regulation requires landfills that have more than 1 million tons of refuse in place to collect and control the landfill gas that is generated by waste decomposition and specifies numerous operating, monitoring, and reporting requirements for subject operations. Regulation 8, Rule 34 has required that the landfill at this site be controlled by an active landfill gas collection system and a landfill gas control system since 1994.

Landfills and landfill gas combustion equipment are also potentially subject to either the federal New Source Performance Standards (NSPS) for Municipal Solid Waste (MSW) Landfills or the Emission Guidelines (EG) for MSW Landfills. The federal NSPS for MSW Landfills (40 CFR Part 60, Subpart WWW) applies to landfills that have had a design capacity modification after May 30, 1991. The EG for MSW Landfills (40 CFR Part 60, Subpart Cc) applies to landfills that have had no design capacity modification since May 30, 1991 but that have accepted waste since November 8, 1987. The Palo Alto Landfill has had no design capacity modifications but has accepted waste after November 8, 1987. Therefore the EG regulations are applicable to this landfill.

The BAAQMD implemented the EG by amending Regulation 8, Rule 34 on October 6, 1999. Initially, Bay Area landfills were subject to the Federal Plan for MSW Landfills (40 CFR Part 62, Subpart GGG) until EPA incorporated the October 1999 amendments to Regulation 8, Rule 34 into the California State Plan for MSW Landfills (40 CFR § 62.1115). On September 20, 2001, EPA amended the California State Plan to include the BAAQMD's October 1999

amendments and amended the Federal Plan to remove Bay Area landfills from the Federal Plan, effective November 19, 2001. Therefore, BAAQMD Regulation 8, Rule 34, as amended on October 1999, is federally enforceable. In addition, the October 1999 amendments were adopted into the SIP, effective August 30, 2002.

In accordance with the EG, BAAQMD Regulation 8, Rule 34 requires landfills with a design capacity of more than 2.5 million Mg and more than 2.5 million m^3 to be equipped with landfill gas collection and control systems. The design capacity of the Palo Alto Landfill exceeds these applicability criteria. Subject landfills and the associated collection and control systems are required to meet numerous operating, monitoring, and reporting requirements. These requirements are specified in detail in Section IV of the permit.

Landfill operations and landfill gas combustion devices are also subject to numerous other BAAQMD regulations and permit conditions. All applicable requirements are described in Section IV of the permit.

The composting operations (S-5, S-6, S-7, S-8 and A-5) are not subject to any federal requirements other than SIP requirements. These operations are subject to several BAAQMD regulations and to permit conditions. All applicable requirements are described in Section IV of the permit.

V. Schedule of Compliance

A schedule of compliance is required in all Title V permits pursuant to BAAQMD Regulation 2-6-409.10 which provides that a major facility review permit shall contain the following information and provisions:

"409.10 A schedule of compliance containing the following elements:

- 10.1 A statement that the facility shall continue to comply with all applicable requirements with which it is currently in compliance;
- 10.2 A statement that the facility shall meet all applicable requirements on a timely basis as requirements become effective during the permit term; and
- 10.3 If the facility is out of compliance with an applicable requirement at the time of issuance, revision, or reopening, the schedule of compliance shall contain a plan by which the facility will achieve compliance. The plan shall contain deadlines for each item in the plan. The schedule of compliance shall also contain a requirement for submission of progress reports by the facility at least every six months. The progress reports shall contain the dates by which each item in the plan was achieved and an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted."

Since the District has not determined that the facility is out of compliance with an applicable requirement, the schedule of compliance for this permit contains only sections 2-6-409.10.1 and 2-6-409.10.2.

The BAAQMD Compliance and Enforcement Division has conducted a review of compliance during August 2001 through July 2002 and has no records of compliance problems at this facility during this time period. The compliance report is contained in Appendix A of this permit evaluation and statement of basis.

VI. Permit Conditions

During the Title V permit development, the District has reviewed the existing permit conditions, deleted the obsolete conditions, and, as appropriate, revised the conditions for clarity and enforceability. Each permit condition is identified with a unique numerical identifier, up to five digits.

While the District has authority to revise the existing permits, and is doing so here concomitantly with the Title V process, it also has authority to supplement the terms of existing permits through the Title V process itself. When necessary to meet Title V requirements, additional monitoring, record keeping, or reporting has been added to the permit.

All changes to existing permit conditions are clearly shown in "strike-out/underline" format in the proposed permit. When the permit is issued, all "strike-out" language will be deleted; all "underline" language will be retained, subject to consideration of comments received.

The existing permit conditions are derived from previously issued District Authorities to Construct or Permits to Operate. Permit conditions may also be imposed or revised as part of the annual review of the facility by the District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in BAAQMD Regulation 2, Rule 6, Major Facility Review.

The District has reviewed and, where appropriate, revised or added new annual and daily throughput limits on sources so as to help ensure compliance with District rules addressing preconstruction review, BAAQMD Regulation 2-1-301. For a grandfathered source (a source in existence before 1979, which in this case is the S-1 Palo Alto Landfill) these limits are being added to the existing permits pursuant to the authority in Regulation 2-1-403, which provides the District with authority to "impose any permit condition [it] deems reasonably necessary to insure compliance with federal or California law or District regulations." Creating throughput limits for grandfathered sources is not required by either Part 70 or the District's MFR rules. However, issuance of the Title V permit is an opportunity for the District to exercise authority under Regulation 2-1-403 by adding conditions to the District operating permit through a parallel process, that is, by revising the Permit to Operate concurrently with the Title V permit issuance. The District believes the addition of these throughput limits is authorized under Regulation 2-6-409.2.2, as these limits will help "assure compliance" with the District preconstruction review program.

The applicability of preconstruction review depends on whether there is a "modified source" as defined in BAAQMD Regulation 2-1-234. Whether there is a modified source depends in part on whether there has been an "increase" in "emission level." Regulation 2-1-234 defines what will be considered an emissions level increase, and takes a somewhat different approach depending on whether a source has previously permitted by the District. Sources that were modified or constructed since the District began issuing new source review permits will have permits that contain throughput limits, and these limits are reflected in the Title V permit. These limits have previously undergone District review, and are considered to be the legally binding "emission level" for purposes of Regulations 2-1-234.1 and 2-1-234.2. By contrast, for older

sources that have never been through preconstruction review (commonly referred to as "grandfathered" sources), an "increase" in "emission level" is addressed in Regulation 2-1-234.3. A grandfathered source is not subject to preconstruction review unless its emission level increases above the highest of: 1) the design capacity of the source, 2) the capacity listed in a permit to operate, or 3) the highest capacity demonstrated prior to March 2000. However, if the throughput capacity of a grandfathered source is limited by upstream or downstream equipment (i.e., is "bottlenecked"), then the relaxing of that limitation ("debottlenecking") is considered a modification.

In proposing throughput limits for grandfathered sources, the District has described the limits differently based on the factual support in the record. The limit may be a reporting threshold, in which case if the limit is exceeded and not reported, a permit violation has occurred. Secondly, it may be a firm throughput limit, in which case a permit violation occurs whenever the limit is exceeded. Thirdly, it may be a Regulation 2-1-234.3 modification threshold, in which case exceedence of the limit triggers a requirement to obtain an Authority to Construct. Where the information in the record is indicative of a Regulation 2-1-234.3 threshold, but not definitive in that regard, the limit is structured as a reporting threshold, and as presumptively an emissions limit and a modification threshold (presumptive limit). Where, on the other hand, the District believes the information in the record is definitive, the limit is structured as a firm throughput limit and a modification threshold. It would be redundant for a limit to function as both a reporting threshold and a throughput limit, and so the latter will normally preclude the former.

As noted, for presumptive limits, exceedence of the limit is not per se a violation of the permit. *Failure to report an exceedence would be a permit violation.* If an exceedence occurs, the facility would have an opportunity to demonstrate that the throughput limit in fact did not reflect the appropriate limit for purposes of Regulation 2-1-234.3. If the facility can demonstrate this, no enforcement action would follow, and the permit would be revised at the next opportunity. It also follows that compliance with these limits is not a "safe harbor" for the facility. If evidence clearly shows that a grandfathered source has undergone a "modification" as defined in Regulation 2-1-234.3, the District would consider that a preconstruction review-triggering event, notwithstanding compliance with the throughput limit in the Title V permit. There is no Title V "permit shield" associated with throughput limits for grandfathered sources.

Conditions have also been modified or deleted due to the following:

- Condition is obsolete,
- Condition has no regulatory basis,
- Redundancy in record-keeping requirements,
- Redundancy in other conditions, regulations and rules,
- The condition has been superseded by other regulations and rules,
- The equipment has been taken out of service or is exempt,
- The event has already occurred (i.e. initial or start-up source tests),

The regulatory basis is listed following each condition. The regulatory basis may be a rule or regulation. The District is also using the following terms for regulatory basis:

- BACT: This term is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.

- Cumulative Increase: This term is used for a condition imposed by the APCO that limits a source's operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- Offsets: This term is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- PSD: This term is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- TRMP: This term is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy.

Parameter monitoring has been added for each abatement device**.** Additional monitoring has been added, where appropriate, to assure compliance with the applicable requirements. The reasons for the changes to each condition are discussed further below.

Condition # 1028
For: S-1 Palo Alto Landfill with Gas Collection System and A-3 Landfill Gas Flare

The District is proposing to replace some of the existing permit condition text for the landfill with new standardized text developed during the Title V permitting process. Exact text changes are identified in the draft MFR Permit. The reasons for the changes to each condition number are discussed further below. The original parts 4 and 5 are restatements of Regulation 8, Rule 34 requirements that do not need to be repeated in permit conditions and have therefore been deleted altogether.

Part 1: Waste acceptance rate limits were added to define the capacity of the landfill, which is a grandfathered source. The total cumulative waste disposal limit (subpart b) and the design capacity limit (subpart c) pertain to regulation of VOC emissions from decomposing waste in the landfill. The daily waste acceptance limit (subpart a) pertains to regulation of particulate emissions from waste transport and disposal. The daily waste acceptance limit and design capacity limit were determined from information provided in the City of Palo Alto's Initial Design Capacity Report and Solid Waste Facility Permit. These limits are proposed as firm throughput limits and modification thresholds, so that any change to these rates constitutes a modification of the landfill source as defined in Regulation 2-1-234.4 and is subject to the Authority to Construct requirements of Regulation 2-1-301. The cumulative waste disposal limit is based on assumptions regarding compaction density and current cover practices. The correlation between the total cumulative waste disposal limit and emissions is therefore changeable based on these variables. Accordingly, this limit is proposed as a reporting threshold and as a presumptive throughput limit and modification threshold.

Part 2: The City of Palo Alto stated that no contaminated soil would be accepted at this site. Part 2 reflects this statement and clarifies the District's "contaminated" soil definitions from Regulation 8, Rule 40.

Part 3: Any on-site handling operations of non-contaminated soil (low VOC soil or VOC-laden soil) are subject to Regulation 8, Rule 2. Due to the fugitive nature of the organic

emissions that occur due to handling VOC-laden soil, the source testing procedures typically used to determine compliance with the 300 ppm total carbon limit (Regulation 8-2-301) are not appropriate. However, Regulation 8-40-604 describes a surface VOC emission testing procedure for determining whether soil is contaminated or not. Soil is contaminated – as defined in Regulation 8-40-205 – if the surface VOC is greater than 50 ppmv as methane. Since this facility does not accept contaminated soil, the surface VOC emissions from all soil handling operations will not exceed 50 ppmv as methane, which is equivalent to 50 ppmv of total carbon. Therefore, the emissions from VOC-laden soil could not exceed 300 ppmv of total carbon and compliance with 8-2-301 is assured. Note that the use of Regulations 8-40-205 and 8-40-604 to show compliance with Regulation 8-2-301 requires a permit shield, which has been added to Section IX of the MFR Permit. Monitoring and record keeping requirements were added to this part to demonstrate that each soil lot is not contaminated.

Part 4: This part describes the dust mitigation measures necessary to maintain compliance with the Regulation 6-301 and 6-305 limits.

Part 5: This part replaces part 1 of the original conditions. Part 1 contained a reference to an obsolete surface emission limit. The new text identifies approved landfill gas control equipment, clarifies the operating requirements for the flare, and prohibits intentionally venting of collected landfill gas.

Part 6: This part replaces part 2 of the original conditions. The text of this condition was rephrased into the current standard continuous operation requirement for landfill gas collection systems. This part elaborates on the requirement to operate the gas collection system continuously (8-34-301.1) and is based on the definition of continuous operation (8-34-219). The exemption Sections (113,116,117,118) describe situations in which a few wells may be shut down for short periods of time in order to perform necessary installations, repairs, maintenance, etc. on the system.

Part 7: This part replaces part 3 of the original conditions. Text was added to clearly identify the required landfill gas collection system components (92 vertical wells). Regulation 8, Rule 34 requires that the gas collection system be operated continuously. Continuous operation is defined as having all wells and collectors operating under vacuum and with landfill gas flow. Therefore, it is critical that the landfill gas collection system be clearly defined, so that both the operator and the District are aware of which wells and collectors are required to be under vacuum (and to meet the other requirements of 8-34-305).

Part 8: This part was added to identify the heat input limits for the A-3 Landfill Gas Flare, which define the maximum rated capacity for this equipment. These limits were derived from the information in Permit Application # 31. These heat input limits combined with the nitrogen oxide and carbon monoxide emission concentration limits in Parts 11 and 12 will ensure that emissions will not increase as a result of a replacement or modification that increases the capacity of a permitted source without a preconstruction permit review.

Deleted Part 8: This original part specified provisional corrective measures for the flare, if the flare temperature became erratic. Since flare temperature has not been found to be erratic these provisional measures are not necessary. Therefore, the District is proposing to delete this unnecessary condition.

Part 9: This part replaces the original flare temperature monitoring requirement and flare temperature limit from the original parts 6 and 7, respectively. The minimum temperature limit was changed to a minimum temperature averaged over any three-hour period for consistency with the federal Emission Guidelines for MSW Landfills. This part incorporates the EG procedure for establishing a minimum temperature limit based on source test results. The District previously required a minimum temperature of 1400 °F to ensure adequate destruction of toxic compounds, which is reflected in the criteria for modifying a temperature limit based on source test results. In addition, the minimum temperature was increased from 1400 °F to 1470 °F, based on the most recent source test data for A-3 and the EG procedure described in this part.

Part 10: Part 9 of the original conditions was renumbered as part 10. The basis was added for these flare equipment requirements.

Part 11: The NO_x emission rate in the permit application for this flare is an implied limit. For the MFR permit, an explicit NO_x limit is necessary to show that the flare is operating properly and that the allowable emission rate has not been exceeded. This emission limit is derived below based on the maximum emission rate that was reported in Permit Application # 31 (0.125 pounds of NO_x per million BTU). The landfill gas is assumed to contain 55% methane with a heating value of 557 BTU/ft^3 at 60 °F. (Definitions of the terms used below are contained in the glossary.)

(0.125 pounds NO_x/MM BTU)/(10^6 BTU/MM BTU)*(557 BTU/ft^3 LFG)/
(5.1506 ft^3 flue gas, dry, 0% O_2/ft^3 LFG)/(3.521 ft^3 flue gas, 15% O_2/
1.0 ft^3 flue gas, 0% O_2)/(46.01 pounds NO_x/lbmol)*(379.5 ft^3/lbmol)
= 3.17 E-5 ft^3 of NO_x/ft^3 of flue gas at 15% O_2
= 32 ppmv of NO_x at 15% O_2, dry basis

Part 12: The CO emission rate in the permit application for this flare is an implied limit. For the MFR permit, an explicit CO limit is necessary in order to verify that the flare is operating properly and that the allowable emission rate has not been exceeded. The emission limit is derived below based on the maximum emission rate that was reported in Permit Application # 31 (0.50 pounds of CO per million BTU). The landfill gas is assumed to contain 55% methane with a heating value of 557 BTU/ft^3 at 60 °F (547 BTU/scf). (Definitions of the terms used below are contained in the glossary.)

(0.50 pounds CO/MM BTU)/(10^6 BTU/MM BTU)*(557 BTU/ft^3 LFG)/
(5.1506 ft^3 flue gas, dry, 0% O_2/ft^3 LFG)/(3.521 ft^3 flue gas, 15% O_2/
1.0 ft^3 flue gas, 0% O_2)/(28.01 pounds CO/lbmol)*(379.5 ft^3/lbmol)
= 2.08 E-4 ft^3 of CO/ft^3 of flue gas at 15% O_2
= 208 ppmv of CO at 15% O_2, dry basis

Deleted Part 10: This original part was a provisional CO modeling requirement, if CO emissions were found to exceed 550 pounds/day. Part 12 above limits CO emissions to 360 pounds of CO per day. Therefore, this modeling requirement cannot be triggered. The District is proposing to delete this unnecessary condition.

Part 13: Part 11 of the original conditions was renumbered as part 13. The District is proposing to add a time period by which the permit application must be submitted and the basis for this requirement.

Part 14: All landfill gas combustion equipment is subject to the BAAQMD Regulation 9-1-302 limit of no more than 300 ppmv of SO_2 in the exhaust (dry basis). Under theoretical combustion conditions, 300 ppmv of SO_2 in the exhaust is equal to 1300 ppmv of total reduced sulfur (expressed as H_2S) in landfill gas. This part explains that a landfill gas sulfur limit will be used as a surrogate for demonstrating compliance with the BAAQMD Regulation 9-1-302 sulfur dioxide limit. This part requires quarterly testing of the landfill gas to demonstrate compliance with the surrogate sulfur concentration limit and describes acceptable test methods.

Part 15: This part establishes annual source testing at the flare to demonstrate compliance with the Regulation 8-34-301.3 NMOC emission limit and the NOx and CO concentration limits in part 11 and 12. This part expands upon the Regulation 8-34-412 source testing requirement and provides additional details about testing, notifying, and reporting procedures.

Part 16: This part describes the annual landfill gas characterization test, which is also required pursuant to BAAQMD Regulation 8-34-412, in more detail.

Part 17: Record keeping requirements were added to ensure compliance with Regulations 6-301, 6-305, 8-2-301, 8-34-301, and 8-34-304.

Part 18: The MSW Landfill NESHAP (40 CFR, Part 63, Subpart AAAA) that was adopted by EPA on 1/16/03 requires landfill operators to submit semi-annual reports instead of the annual report required by Regulation 8-34-411. The effective date for this new reporting frequency is January 16, 2004. This permit condition was added in order to establish the semi-annual reporting frequency and to synchronize the reporting periods and submittal dates for this report with the semi-annual MFR monitoring reports that will be required by Section I.F of the MFR Permit. This is a new condition.

Condition# 20476
For: S-5 Wood Grinder and A-5 Water Scrubber

Part 1: The annual throughput limit for wood waste was corrected. The previous limit was imposed in error and has been corrected pursuant to Application # 4346. The revised wood waste throughput limit results in maximum annual emissions of 0.3 tons/year of

PM_{10}. Maximum daily emissions are 9.6 pounds/day of PM_{10} based on processing a maximum of 800 tons/day of wood waste (50 tons/hour for 16 hours/day).

Part 5: Text was added to clarify that persistent visible emissions require corrective action. The basis for this monitoring requirement was corrected.

Condition# 20477
For: S-6 Diesel Engine, Driver for S-5 Wood Grinder

Part 8: Text was added to clarify that persistent visible emissions require corrective action. The basis for this monitoring requirement was corrected.

Condition# 20478
For: S-7 Trommel Screen

Part 1: The annual throughput limit for wood waste was corrected. The previous limit was imposed in error and has been corrected pursuant to Application # 4346. The revised wood waste throughput limit results in maximum annual emissions of 0.118 tons/year of PM_{10}. Maximum daily emissions are 3.76 pounds/day of PM_{10} based on processing a maximum of 800 tons/day of wood waste (50 tons/hour for 16 hours/day).

Part 5: Text was added to clarify that persistent visible emissions require corrective action. The basis for this monitoring requirement was corrected.

Condition# 20479
For: S-8 Diesel Engine, Driver for S-7 Trommel Screen

Part 8: This part was deleted, because the Ringelmann 2 limit that is applicable to this engine allows some visible emissions. No visual monitoring is necessary for this engine, because emissions from S-8 are low and violations of the Ringelmann 2 limit are not expected to occur.

VII. Applicable Limits and Compliance Monitoring Requirements

This section of the permit is a summary of numerical limits and related monitoring requirements for each source. The summary includes a citation for each monitoring requirement, frequency of monitoring, and type of monitoring. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The tables below contain only the limits for which there is no monitoring or inadequate monitoring in the applicable requirements. The District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be provided in the discussion when no monitoring is proposed due to the size of a source.

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

These factors are the same as those historically applied by the District in developing monitoring for applicable requirements**.** It follows that, although Title V calls for a re-examination of all monitoring**,** there is a presumption that these factors have been appropriately balanced and incorporated in the District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation**.** Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the District will generally revise the nature or frequency of monitoring only when it can support a conclusion that existing monitoring is inadequate**.**

NO_X Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
A-3 Landfill Gas Flare	BAAQMD Condition # 1028, Part 11	≤ 32 ppm of NOx at 15% O_2, dry	Annual Source Test; Condition # 1028, Part 15

NOx Discussion:
The District has imposed an annual source test requirement for NO_x limits at landfill gas fired flares in other Title V permits. Annual source testing is a standard monitoring method for engines that are used for control of landfill gas. Flares control a comparable quantity of landfill gas and have much lower emissions. Therefore annual source testing is adequate.

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
A-3 Landfill Gas Flare	BAAQMD Condition # 1028, Part 12	≤ 208 ppmv of CO at 15% O_2, dry	Annual Source Test Condition # 1028, Part 15

CO Discussion:
The District has imposed an annual source test requirement for CO limits at landfill gas fired flares in other Title V permits. Annual source testing is a standard monitoring method for engines that are used for control of landfill gas. Flares control a comparable quantity of landfill gas and have much lower emissions. Therefore annual source testing is adequate.

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Palo Alto Landfill with Gas Collection System, S-6 Diesel Engine, S-8 Diesel Engine, and A-3 Landfill Gas Flare	BAAQMD 9-1-301	Property Line Ground Level SO_2 Limits: ≤ 0.5 ppm for 3 minutes and ≤ 0.25 ppm for 60 minutes and ≤ 0.05 ppm for 24 hours	None
A-3 Landfill Gas Flare	BAAQMD 9-1-302	Exhaust Point Limit: ≤ 300 ppmv (dry) of SO_2	Quarterly Analysis of Landfill Gas for Sulfur Content

SO_2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Palo Alto Landfill with Gas Collection System	Condition # 1028, Part 14	Landfill Gas Sulfur Content Limit: $\leq$ 1300 ppmv (dry) of TRS, expressed as H_2S	Quarterly Analysis of Landfill Gas for Sulfur Content
S-6 Diesel Engine and S-8 Diesel Engine	BAAQMD 9-1-304	Fuel Sulfur Content Limit: $\leq$ 0.5 % sulfur by weight	Records of Vendor Certifications of Fuel Sulfur Content

SO2 Discussion:
Maximum potential sulfur dioxide (SO_2) emissions are calculated below for all sources followed by a discussion of each applicable limit related to sulfur dioxide emissions. Definitions of the terms used below are contained in the glossary.

Potential to Emit Calculations for S-6 Diesel Engine:
Maximum potential SO_2 emissions are based on the maximum permitted fuel sulfur content of 0.05% sulfur by weight and the maximum permitted fuel usage rate of 72,962 gallons/year.
(72,962 gallons fuel/year)*(7.1 pounds fuel/gallon fuel)*(0.0005 pounds sulfur/pound fuel)/
(32.06 pounds sulfur/lbmol sulfur)*(1 lbmol SO_2/lbmol sulfur)*(64.06 pounds SO_2/lbmol SO_2)/
(2000 pounds SO_2/ton SO_2) = 0.26 tons SO_2/year

Potential to Emit Calculations for S-8 Diesel Engine:
Maximum potential SO_2 emissions are based on the maximum permitted fuel sulfur content of 0.05% sulfur by weight and the maximum permitted fuel usage rate of 7,557 gallons/year.
(7,557 gallons fuel/year)*(7.1 pounds fuel/gallon fuel)*(0.0005 pounds sulfur/pound fuel)/
(32.06 pounds sulfur/lbmol sulfur)*(1 lbmol SO_2/lbmol sulfur)*(64.06 pounds SO_2/lbmol SO_2)/
(2000 pounds SO_2/ton SO_2) = 0.03 tons SO_2/year

Potential to Emit Calculations for the A-3 Landfill Gas Flare:
(1000 ft^3/min)*(60 min/hour)*(24 hours/day)*(365 days/year)*(1300 ft^3 H_2S/10^6 ft^3 LFG)/
(379.5 ft^3 H_2S/lbmol H_2S)*(1 lbmol SO_2/1 lbmol H_2S)*(64.06 pounds SO_2/lbmol SO_2)/
(2000 pounds SO_2/ton SO_2) = 57.67 tons/year of SO_2

Since Bay Area landfill gas been found to contain no more than 400 ppmv of TRS (expressed as H_2S), sulfur dioxide emissions are not expected to exceed 17.75 tons of SO_2 per year.

Maximum potential sulfur dioxide emissions for this facility are (0.26+0.03+57.67) 57.96 tons/year and actual sulfur dioxide emissions are expected to be no more than (0.26+0.03+17.75) 18.04 tons/year.

BAAQMD Regulation 9-1-301: As discussed below for BAAQMD Regulations 9-1-302 and 9-1-304, this facility will be subject to federally enforceable limits, which will ensure compliance with the Regulation 9-1-302 gas stream emission limit of 300 ppmv of SO_2 in the exhaust from the flare and with the Regulation 9-1-304 fuel sulfur content limit of 0.5% sulfur

by weight. Sources complying with the Regulation 9-1-302 or 9-1-304 limits are not expected to result in an excess of the ground level concentration limits listed in Regulation 9-1-301. Air dispersion modeling at other landfills has confirmed this conclusion. Furthermore, actual sulfur dioxide emissions from the flare are expected to be less than 100 ppmv (less than one third of the limit) based on landfill gas sulfur content data for other Bay Area landfills. Permit conditions require that the S-6 and S-8 Diesel Engines use low sulfur fuel containing no more than 0.05% sulfur by weight (one tenth of the limit). Therefore, sulfur dioxide emissions from this site are expected to be well below the rates allowed by Regulations 9-1-302 and 9-1-304, and the margin of compliance with the Regulation 9-1-301 ground level sulfur dioxide limits is expected to be very high. Monitoring for ground level SO_2 concentrations, in addition to the landfill gas monitoring and record keeping requirements proposed below, would not be appropriate, because violations of the Regulation 9-1-301 limits are not expected to be possible.

BAAQMD Regulation 9-1-302: This facility will be subject to a federally enforceable limit of 1300 ppmv of Total Reduced Sulfur (TRS) in the landfill gas (BAAQMD Condition # 1028, Part 14). As shown by the calculation below, this limit will ensure compliance with the BAAQMD Regulation 9-1-302 limit of 300 ppmv of SO_2 in the flare exhaust. The landfill gas is assumed to contain 45% methane, which will produce 4.396 dry cubic feet of flue gas per cubic foot of landfill gas under theoretical combustion conditions (no excess air).
(1300 scf H_2S / 10^6 scf LFG)*(1 scf SO_2/1 scf H_2S)/(4.396 sdcf flue gas at 0% O_2 / scf LFG)
= 2.96E-4 scf SO_2 / sdcf flue gas at 0% O_2 = 296 ppmv of SO_2 at 0% O_2, dry basis
Staff has proposed permit conditions that require the landfill gas to be monitored for TRS content on a quarterly basis (Condition # 1028, Part 14) to ensure compliance with the landfill gas concentration limit of 1300 ppmv of TRS. District analyses have not found any Bay Area landfill gas containing more than 400 ppmv of TRS, which is less than a third of the allowable emission rate. Since the margin of compliance is high, the proposed monitoring is appropriate for demonstrating compliance with this limit.

BAAQMD Regulation 9-1-304: In accordance with BAAQMD Condition # 20477, Part 6 and BAAQMD Condition # 20479, Part 6, this facility is required to maintain records of vendor-certified sulfur content for all fuels burned in the S-6 and S-8 Diesel Engines. The use of vendor certification is a standard method of monitoring for compliance with a liquid fuel sulfur content limit.

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Palo Alto Landfill with Gas Collection System	BAAQMD 6-301	Ringelmann 1.0	Records of all site watering and road cleaning events
S-5 Wood Grinder, S-6 Diesel Engine, and S-7 Trommel Screen	BAAQMD 6-301	Ringelmann 1.0	Visual observation of source during operation
S-8 Diesel Engine	BAAQMD 6-303	Ringelmann 2.0	None

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-6 Diesel Engine and S-8 Diesel Engine	BAAQMD 6-310	$\leq$ 0.15 grains/dscf	None
A-3 Landfill Gas Flare	BAAQMD 6-310	$\leq$ 0.15 grains/dscf	None
S-5 Wood Grinder and S-7 Trommel Screen	BAAQMD 6-311	$E = 0.026(P)^{0.67}$ where: E = Allowable Emission Rate (lb/hr); and P = Process Weight Rate (lb/hr) Maximum Allowable Emission Rate When P >57,320 lb/hr: E = 40 lb/hour	None

PM Discussion:

BAAQMD Regulation 6-301: The active filling operations and associated vehicle traffic can generate significant particulate emissions. Presently this facility has no means of demonstrating compliance with the Regulation 6-301, which limits visible emissions to no darker than 1.0 on the Ringelmann Chart (except for periods or aggregate periods less than 3 minutes in any hour). Additional monitoring is required pursuant to Part 70 of the Clean Air Act. Typically, landfills maintain compliance with Regulation 6-301 by employing a dust mitigation program and using visual monitoring by site operators to ensure that dust mitigation measures are adequate. Dust mitigation measures include the application of water and/or dust suppressants on unpaved roads, fill areas, stockpiles, and other dust prone operations and sweeping, watering, or other cleaning measures on paved roads and parking areas. The frequency of watering and sweeping schedules varies from several water applications/day for dry days to no watering or sweeping on rainy days. City of Palo Alto landfill's watering requirements are specified in Condition # 1028, Part 4 (proposed). The District is proposing to add record keeping requirements of all water and/or dust suppressant applications and road cleaning activities (Condition # 1028, Part 17d), in order to demonstrate compliance with the Regulation 6-301. District inspectors will occasionally observe the landfill operations on dry days to ensure that the dust mitigation measures in place are adequate to maintain compliance with the Ringelmann 1.0 limit.

BAAQMD Regulation 6-301 for S-5, S-6, and S-7: Observing a source during operation is a standard method of monitoring for visible emissions. The Permit Holder is required to take all steps necessary to prevent persistent visible emissions from each of these sources including shutting down the source if necessary. Since particulate emissions are visible before a Ringelmann 1.0 limit would be exceeded, these steps should prevent the exceedance of the Ringelmann 1.0 limit.

BAAQMD Regulation 6-301 for A-3 Landfill Gas Flare: Visible particulate emissions are normally not associated with combustion of gaseous fuels, such as natural gas or landfill gas. The AP-42 PM emission factor for an enclosed ground flare burning landfill gas is 0.0171 pounds/MM BTU. Therefore, the maximum potential emissions from the A-3 Flare (rated

capacity 30 MM BTU/hour) are approximately 2.25 tons/year of PM_{10}. Since particulate emissions are not significant and violations of Ringelmann 1.0 limit are not expected, periodic monitoring for the Ringelmann limit would not be appropriate for this flare.

BAAQMD Regulation 6-303 for S-8 Diesel Engine: This small diesel fired engine (96 bhp) is used to provide power to the S-7 Trommel Screen. Such engines generally are able to meet a Ringelmann No. 2 limit. Particulate emissions from this engine are very low:
(0.10 g/bhp)*(96 bhp)/(453.6 g/lb)*(1600 hours/year)/(2000 lb/ton) = 0.017 tons/yr PM_{10}
Since the likelihood of non-compliance is low and maximum potential emissions are not significant, periodic monitoring for the Ringelmann 2.0 limit would not be appropriate for this small engine.

BAAQMD Regulation 6-310 for S-6 and S-8 Diesel Engines: From Application # 4346, maximum permitted particulate emissions from the S-6 and S-8 Diesel Engines are 0.10 tons/year and 0.02 tons/year, respectively. BAAQMD Regulation 6-310 limits filterable particulate (FP) emissions from any source to 0.15 grains per dry standard cubic foot (gr/dscf) of exhaust volume. Using the applicable emission factor (0.07 grams/bhp-hour for S-6 and 0.10 grams/bhp-hour for S-8), a typical diesel oil flue gas production rate of 9190 dscf/MM BTU at 0% oxygen, and a typical flue gas oxygen content of 15%, the particulate grain loading in the exhaust from each engine is determined to be less than 0.01 gr/dscf at 15% oxygen:
S-6 Diesel Engine:
(0.07 grams/bhp-hour)*(860 bhp)*(7000 grains/453.6 grams)/(44.4 gallons diesel/hour)/
(0.137 MM BTU/gallon)/(9190 dscf flue gas/MM BTU)*(20.95-15)/(20.95-0)
= 0.005 grains/dscf @ 15% O_2
S-8 Diesel Engine:
(0.10 grams/bhp-hour)*(96 bhp)*(7000 grains/453.6 grams)/(4.7 gallons diesel/hour)/
(0.137 MM BTU/gallon)/(9190 dscf flue gas/MM BTU)*(20.95-15)/(20.95-0)
= 0.007 grains/dscf @ 15% O_2
For the S-6 and S-8 Diesel Engines, the compliance margin with the Regulation 6-310 limit is more than 20:1. Periodic monitoring for compliance this limit would not be appropriate for S-6 and S-8, because particulate emissions are low and source testing for PM emissions from portable diesel engines such as these is difficult and costly.

BAAQMD Regulation 6-310 for A-3 Landfill Gas Flare:
The maximum potential PM_{10} emissions from this flare are based on the AP-42 emission factor for flares burning landfill gas (17 pounds/MM dscf methane), the average landfill gas methane content (45% CH_4), the maximum permitted heat input rate to the flare (30 MM BTU/hour), and continuous operation.
(30E6 BTU/hour)*(24 hours/day)*(365 days/year)/(456 BTU/ft^3 LFG)*(0.55 ft^3 CH_4/ft^3 LFG)*
(17 pounds PM_{10}/1E6 ft^3 CH_4)/(2000 pounds/ton) = 2.69 tons/year of PM_{10}/year

Using the AP-42 emission factor above and assuming the landfill gas contains 45% methane, the maximum PM_{10} emission rate from A-3 is:
(17 pounds PM_{10}/1E6 ft^3 CH_4)*(7000 grains/pound)*(0.55 ft^3 CH_4/ft^3 LFG)/
(4.396 ft^3 flue gas, dry, 0% O_2/ft^3 LFG) = 0.015 grains/dscf @ 0% O_2
For the A-3 Landfill Gas Flare, the compliance margin with the Regulation 6-310 limit is 10:1. Periodic monitoring for compliance with this limit would not be appropriate for A-3, because the

Regulation 6-310 grain-loading limit is far above any expected PM emissions from this flare and particulate emissions are low.

BAAQMD Regulation 6-311 for S-5 Wood Grinder and S-7 Trommel Screen: This regulation limits mass emissions on a sliding scale based on the process weight rate. Since it would be virtually impossible to meaningfully monitor compliance with these limits due to variable operation rates and the fugitive nature of the particulate emissions, emission calculations will be used to demonstrate on-going compliance with this regulation using assumptions about material throughput and emission rates.

For the S-5 Wood Grinder, BAAQMD has accepted an unabated particulate emission factor of 0.024 pounds/ton (from AP-42 "log debarking") for wood chippers and tub grinders. The S-5 Wood Grinder has a maximum wood waste capacity of 50 tons/hour, resulting in a maximum unabated particulate emission rate of 1.2 pounds/hour. Water Sprays (A-5) are used to control particulate emissions and are expected to achieve at least 50% control, resulting in a maximum emission rate of 0.6 pounds/hour. At a process weight rate of 50 tons per hour, Regulation 6-311 limits emissions to 40 pounds/hour (maximum allowable emission rate for any operation processing more than 57,320 pounds/hour of material). The maximum allowable emission rate is more than 30 times higher than the expected unabated emission rate. The same holds true for any process weight rate at which S-5 may be operating. Therefore, no monitoring is recommended for this standard.

The S-7 Trommel Screen rotates yard waste and chipped wood in a drum shaped screen to remove dirt and small debris. The following continuous drop material handling equation from AP-42 Chapter 13.2.4 "Aggregate Handling And Storage Piles" may be useful in estimating particulate emissions from Trommel screens because of the similarities of the operations:

$$E = k(0.0032) \times \frac{(U/5)^{1.3}}{(M/2)^{1.4}} \quad \text{(lb/ton)}$$

where:
E = emission factor (lb/ton)
k = particle size multiplier (dimensionless)
U = mean wind speed (miles per hour)
M = material moisture content (%)

For the S-7 Trommel Screen, the following variables will be used:
k = 0.35 (to include all particulate < 10 microns in diameter)
U = 15 mph (conservative estimate at the upper boundary of the equation limit)
M = 2 % (midrange estimate)

The emission factor is then calculated to be 0.0047 lb/ton. Therefore, the highest expected unabated emissions from the S-7 Trommel Screen is as follows:
S-7: (50 tons/hr)(0.0047 lb/ton) = 0.235 lb/hr
After control by water sprays (A-5), maximum emissions will be 0.12 pounds/hour.

The maximum capacity emission rate is well below the maximum allowable Regulation 6-311 rate of 40 pounds/hour. Furthermore, emissions from S-7 will be well below the Regulation 6-311 allowable emission rate at any process weight rate. Therefore, no monitoring is recommended for this standard.

Organic Compound Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Palo Alto Landfill with Gas Collection System	BAAQMD 8-2-301	≤ 15 pounds/day of total carbon or ≤ 300 ppm, dry basis, of total carbon in an exhaust point (applies only to aeration of or use as cover soil of soil containing < 50 ppmw of VOC)	Surface Emission Testing and Records

Organic Compound Discussion:

BAAQMD Regulation 8-2-301: The on-site handling operations of non-contaminated soil (low VOC soil or VOC-laden soil) at the landfill are subject to BAAQMD Regulation 8-2-301. Regulation 8-2-301 allows an emission rate of total carbon up to either 15 pounds/day or 300 ppmv (dry). Due to the fugitive nature of the emissions that occur due to handling low VOC soil, the source testing procedures typically used to determine compliance with the 300 ppmv total carbon limit are not appropriate. However, Regulation 8-40-604 describes a surface VOC emission testing procedure for determining whether soil is contaminated or not. Soil is contaminated – as defined in Regulation 8-40-205 – if the surface VOC is greater than 50 ppmv as methane. Since this facility does not accept contaminated soil, the surface VOC emissions from all soil handling operations will not exceed 50 ppmv as methane, which is equivalent to 50 ppmv of total carbon. Therefore, the emissions from VOC-laden soil could not exceed 300 ppmv of total carbon and compliance with 8-2-301 is assured. Note that the use of Regulations 8-40-205 and 8-40-604 to show compliance with Regulation 8-2-301 requires a permit shield, which has been added to Section IX of the MFR Permit. Monitoring and record keeping requirements were added to Condition # 1028, Part 3 to ensure compliance with these requirements.

H_2S Sources

S# & Description	Emission Limit Citation	Emission Limit (Not Federally Enforceable)	Monitoring
S-1 Palo Alto Landfill with Gas Collection System and A-3 Landfill Gas Flare	BAAQMD 9-2-301	Property Line Ground Level Limits: ≤ 0.06 ppm averaged over 3 minutes and ≤ 0.03 ppm averaged over 60 minutes	None

Hydrogen Sulfide (H_2S) Discussion:
BAAQMD Regulation 9-2-301: Hydrogen sulfide can be detected by its odor at concentrations as low as 0.0005 ppmv and is generally identified by its characteristic rotten egg smell a concentration of 0.005 ppmv or less. Therefore, hydrogen sulfide emissions are typically discovered by smell well before the concentration approaches the lowest Regulation 9-2-301 emission limit of 0.03 ppmv. The District rarely receives complaints about hydrogen sulfide odors from Bay Area landfills and has never received any complaints about hydrogen sulfide odors from this facility. Since hydrogen sulfide odors have not been detected at this facility, the concentration of hydrogen sulfide at the property line is expected to be well below the Regulation 9-1-301 limits. Monitoring for ground level H_2S concentrations would not be appropriate when no H_2S odor problem exists. Also, these H_2S limits are not federally enforceable.

Other Limits

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
S-1 Palo Alto Landfill with Gas Collection System	BAAQMD Condition # 1028, Part 1	Waste Acceptance Limits: ≤ 200 tons/day ≤ 5,830,000 tons total, and ≤ 7,759,000 cubic yards total	Records
A-3 Landfill Gas Flare	BAAQMD Condition # 1028, Part 8	≤ 720MM BTU per day and ≤ 262,800 MM BTU per year	Gas Flow Meter and Records
S# & Description	**Emission Limit Citation**	**Emission Limit (Not Federally Enforceable)**	**Monitoring**
S-1 Palo Alto Landfill with Gas Collection System	BAAQMD Condition # 1028, Part 13	Total Chlorinated Compounds in Landfill Gas: ≤ 104 ppmv, dry	Annual Landfill Gas Characterization Analysis and Records

Other Limits Discussion:
BAAQMD Condition # 1028, Part 1: The use of records is a standard method for monitoring for compliance with throughput limits such as these waste acceptance limits.

BAAQMD Condition # 1028, Part 1: The use of a gas flow meter and records is a standard method for monitoring for heat input limits at enclosed flares.

BAAQMD Condition # 1028, Part 13: This limit is not federally enforceable. Therefore, no additional monitoring is required pursuant to Title V. However, the annual landfill gas characterization analysis, which is required by Condition # 1028, Part 16 for other purposes, can also be used to show compliance with this limit.

VIII. Test Methods

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not applicable requirements.

If a rule or permit condition requires ongoing testing, the requirement will also appear in Section IV of the permit.

IX. Permit Shield:

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit that identifies and justifies specific federally enforceable regulations and standards are not applicable to a source or group of sources, or (2) A provision in a major facility review permit that identifies and justifies specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting which are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The District's program does not allow other types of streamlining in Title V permits.

The District added the second type of permit shield for the S-1 Palo Alto Landfill, subsuming the Regulation 8, Rule 2 VOC test procedure with the Regulation 8, Rule 40 VOC test procedure. This was done so that the Regulation 8-2-601 VOC test procedure, which is not well suited to monitoring fugitive emissions, would not have to be used to monitor surface emissions of VOC-laden soil.

Regulation 8, Rule 2 "Miscellaneous Operations" only applies to sources of precursor organic compounds that are not otherwise limited by Regulation 8 or Regulation 10 rules. In the case of the S-1 Palo Alto Landfill, Regulation 8, Rule 2 would apply only to operations involving VOC-laden soil, which is soil that contains some VOC but is not "contaminated" soil as defined in Regulation 8-40-205. Soil which has an organic content exceeding 50 ppmw or that registers an organic concentration greater than 50 ppmv (expressed as methane, C1) is subject to Regulation 8, Rule 40.

Regulation 8-2-301 places a 15 pounds per day limit on VOC emissions having a concentration greater than 300 ppmv (total carbon, dry basis). Since soil found not to be contaminated using the procedures of Regulation 8-40-604 would have a surface VOC concentration less than 50 ppmv (expressed as methane, C1), it can reasonably be assumed that the concentration is also less than 300 ppmv (total carbon, dry basis) as determined by the procedures of Regulation 8-2-601. Therefore, this monitoring is sufficient to assure compliance with Regulation 8-2-301.

D. Alternate Operating Scenarios:

No alternate operating scenario has been requested for this facility.

E. Compliance Status:

A July 31, 2002 office memorandum from the Director of Compliance and Enforcement, to the Director of Permit Services[1], presents a review of the compliance record of City of Palo Alto, Facility #A2721. The Compliance and Enforcement Division staff has reviewed the records for the facility for the period between 8/1/01 through 7/31/02. This review was initiated as part of the District evaluation of an application by City of Palo Alto for a Title V permit. During the period subject to review, activities known to the District include:

- There were no Notices of Violation issued during this review period.
- The District did not receive any alleged complaints.
- The facility is not operating under a Variance or an Order of Abatement from the District Board.
- There were no monitor excesses or equipment breakdowns reported or documented by District staff.

The owner last certified that all equipment was operating in compliance on May 13, 2003. No non-compliance issues have been identified to date.

F. Differences between the Application and the Proposed Permit:

The Title V permit application was submitted on June 20, 2001. This application is the basis for constructing the proposed Title V permit. Differences between the application and the proposed permit include the following:

1. Throughput limits (identified by a basis of Regulation 2-1-301) have been added as necessary to the landfill, which had no existing throughput limits.
2. In their application, the City of Palo Alto did not identify the applicable requirements for their facility. The District has identified the applicable requirements for this facility, including any requirements that were adopted after the Title V permit application was submitted.

[1] As of July 1, 2003, the Permit Services Division is now called the Engineering Division.

3. There are differences in the equipment list presented in the application and the list presented in this permit. This is due to new permits issued during the Title V permitting process as well as changing the status of the permit from a source to an abatement device. The following list provides pertinent details of the differences:
    - S-3 Landfill Gas Flare has been removed from the source list and is designated as an abatement device, A-3 Landfill Gas Flare
    - S-4 Wood Waste Grinder has been removed from the source list because it was shut down and removed from the facility
    - Four sources (S-5 Wood Grinder, S-6 Diesel Engine, S-7 Trommel Screen, and S-8 Diesel Engine) and one abatement device (A-5 Water Sprays) were added to the source list after this new equipment was issued Permits to Operate in April 2003
4. The District is proposing amendments to Conditions # 1028, # 20476, # 20477, # 20478, and # 20479. The proposed revisions are described in detail in Section C.VI of this report.
5. The applicant did not request any permit shields or permit streamlining in the initial application. The District is proposing a permit shield as described in Section C.IX of this report, based on the applicant's comments on the preliminary draft of the permit.

H:\pub_data\titleV\permit\SOB\A2721SOB.doc

APPENDIX A

BAAQMD COMPLIANCE REPORT

APPENDIX B
GLOSSARY

ACT
Federal Clean Air Act

AP-42
An EPA Document "Compilation of Air Pollution Emission Factors" that is used to estimate emissions from numerous source types. It is available electronically from EPA's web site at: http://www.epa.gov/ttn/chief/ap42/index.html

APCO
Air Pollution Control Officer: Head of Bay Area Air Quality Management District

ARB
Air Resources Board

BAAQMD
Bay Area Air Quality Management District

BACT
Best Available Control Technology

Basis
The underlying authority that allows the District to impose requirements.

CAA
The federal Clean Air Act

CAAQS
California Ambient Air Quality Standards

CAPCOA
California Air Pollution Control Officers Association

CARB
California Air Resources Board (same as ARB)

CEQA
California Environmental Quality Act

CFR
The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

CH4 or CH_4
Methane

CO
Carbon Monoxide

CT
Combustion Zone Temperature

Cumulative Increase
The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Used to determine whether threshold-based requirements are triggered.

District
The Bay Area Air Quality Management District

EG
Emission Guidelines

EPA
The federal Environmental Protection Agency.

Excluded
Not subject to any District regulations.

Federally Enforceable, FE
All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60 (NSPS), Part 61 (NESHAPs), Part 63 (MACT), and Part 72 (Permits Regulation, Acid Rain), including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

FP
Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

H2S or H_2S
Hydrogen Sulfide

HAP
Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by 40 CFR Part 63.

HHV
Higher Heating Value. The quantity of heat evolved as determined by a calorimeter where the combustion products are cooled to 60F and all water vapor is condensed to liquid.

LFG
Landfill gas

Major Facility
A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

MAX or Max.
Maximum

MFR
Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Federal Clean Air Act and implemented by District Regulation 2, Rule 6.

MIN or Min.
Minimum

MOP
The District's Manual of Procedures.

MSW
Municipal solid waste

MW
Molecular weight

N2 or N_2
Nitrogen

NA
Not Applicable

NAAQS
National Ambient Air Quality Standards

NESHAPS
National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63.

NMHC
Non-methane Hydrocarbons (Same as NMOC)

NMOC
Non-methane Organic Compounds (Same as NMHC)

NOx or NO_x
Oxides of nitrogen.

NSPS
Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Federal Clean Air Act, and implemented by 40 CFR Part 60 and District Regulation 10.

NSR
New Source Review. A federal program for pre-construction review and permitting of new and modified sources of pollutants for which criteria have been established in accordance with Section 108 of the Federal Clean Air Act. Mandated by Title I of the Federal Clean Air Act and implemented by 40 CFR Parts 51 and 52 and District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

O2 or O_2
Oxygen

Offset Requirement
A New Source Review requirement to provide federally enforceable emission offsets for the emissions from a new or modified source. Applies to emissions of POC, NOx, PM10, and SO2.

Phase II Acid Rain Facility
A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

POC
Precursor Organic Compounds

PM
Particulate Matter

PM10 or PM_{10}
Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

PSD
Prevention of Significant Deterioration. A federal program for permitting new and modified sources of those air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

RMP
Risk Management Plan

S
Sulfur

SIP
State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

SO2 or SO_2
Sulfur dioxide

SSM
Startup, Shutdown, or Malfunction

SSM Plan
A plan, which states the procedures that will be followed during a startup, shutdown, or malfunction, that is prepared in accordance with the general NESHAP provisions (40 CFR Part 63, Subpart A) and maintained on site at the facility.

THC
Total Hydrocarbons (NMHC + Methane)

Title V
Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

TOC
Total Organic Compounds (NMOC + Methane, Same as THC)

TPH
Total Petroleum Hydrocarbons

TRMP
Toxic Risk Management Policy

TRS
Total Reduced Sulfur

TSP
Total Suspended Particulate

VOC
Volatile Organic Compounds

Symbols:

<	=	less than
>	=	greater than
≤	=	less than or equal to
≥	=	greater than or equal to

Units of Measure:

bhp	=	brake-horsepower
btu	=	British Thermal Unit
BTU	=	British Thermal Unit
°C	=	degrees Centigrade
cfm	=	cubic feet per minute
dscf	=	dry standard cubic feet
°F	=	degrees Fahrenheit

ft^3	=	cubic feet
g	=	grams
gal	=	gallon
gpm	=	gallons per minute
gr	=	grains
hp	=	horsepower
hr	=	hour
lb	=	pound
lbmol	=	pound-mole
in	=	inches
m^2	=	square meter
m^3	=	cubic meters
min	=	minute
mm	=	million
MM	=	million
MM BTU	=	million BTU
MMcf	=	million cubic feet
Mg	=	mega grams
ppb	=	parts per billion
ppbv	=	parts per billion, by volume
ppm	=	parts per million
ppmv	=	parts per million, by volume
ppmw	=	parts per million, by weight
psia	=	pounds per square inch, absolute
psig	=	pounds per square inch, gauge
scf	=	standard cubic feet
scfm	=	standard cubic feet per minute
sdcf	=	standard dry cubic feet
sdcfm	=	standard dry cubic feet per minute
yd	=	yard
yd^3	=	cubic yards
yr	=	year