Santa Barbara County
Air Pollution Control District

JUL 15 2009

Mr. Gerardo Rios
USEPA – Permits Office (AIR 3)
75 Hawthorne Street
San Francisco, CA 94105

FID: 08676
Permit: AP 13002
SSID: 03707

Re: Authority to Construct/Permit to Operate 13002

Dear Mr. Rios:

This letter transmits Proposed Authority to Construct/Permit to Operate 13002 for increasing the heat input rate to the IC engine and flare at the Tajiguas Landfill. Included with the proposed permit is a copy of the application submitted by the applicant for this modification. We plan to issue this permit as final after August 28, 2009 provided your office has not objected to such issuance before that date.

If you have any questions, please contact Ben Ellenberger of my staff at (805) 961-8879.

Sincerely,

Michael Goldman, Manager
Engineering & Compliance Division

enc: Proposed ATC/PTO 13002
Application for permit renewal

cc: Fortistar Methane Group LLC FID 08676 Project File SC
ECD Chron File
Brian Shafritz (Cover letter only)

Santa Barbara County
Air Pollution Control District

# Authority to Construct/Permit to Operate No. 13002
# And Part 70 Minor Modification No. 13002



EQUIPMENT OWNERS/OPERATORS:

Fortistar Methane Group LLC

EQUIPMENT LOCATION:

14470 Calle Real, Gaviota
Santa Barbara County, California

STATIONARY SOURCE/FACILITY:

| | | |
|---|---|---|
| County of Santa Barbara Tajiguas Landfill | SSID: | 03707 |
| Fortistar Methane Group LLC | FID: | 08676 |

AUTHORIZED MODIFICATION:

This Authority to Construct (ATC)/Permit to Operate (PTO) approves the following changes to permit conditions:

- Increase the maximum permitted heat input to the generator engine.
- Increase the maximum permitted heat input to the flare.
- Revise the residence time requirements for the flare.

The increase in emissions due to the increase in permitted heat input triggers BACT for CO. Both the generator engine and the flare satisfy BACT for CO.

EQUIPMENT DESCRIPTION:

1. IC Engine, 4231 BHP, LFG-fueled: Caterpillar G3616,S/N 4CG00110
2. LFG Flare, 45' tall, 2000 scfm capacity, LFG Specialties

PROJECT/PROCESS DESCRIPTION:

Landfill: LFG emissions result from anaerobic biological decomposition of organic matter deposited in a landfill. LFG consists primarily of methane ($CH_4$) and carbon dioxide ($CO_2$), with smaller amounts of

non-methane organic compounds (NMOC). Some NMOCs are reactive organic compounds (ROC).

LFG Collection and Handling System: A system to collect landfill gas generated by refuse that is deposited in the existing Tajiguas Landfill. This system is comprised of collection wells, a piping system, a gas collection blower, and gas conditioning equipment to remove particulates and liquids from the collected landfill gas before combustion.

IC Engine/Generator: One process at Tajiguas involves the combustion of landfill gas in the IC Engine powered electrical generator to produce up to 3.1 MW of electrical power. In the IC engine fuel system the landfill gas is further compressed, cooled, and scrubbed of additional condensate and particulates. Additional condensate collected by this system is returned to the landfill gas inlet knockout scrubbers. The fuel is then regulated for pressure and flow by the IC engine's fuel control system.

Enclosed Flare: The 8-foot diameter, 45-foot tall, enclosed ground flare burns up to 2000 SCFM of collected and scrubbed landfill gas. A small quantity (no greater than 0.5 gpm) of landfill condensate is also evaporated in the flare. The enclosed ground flare consists of two burner systems, a low flow burner tip to handle landfill gas flows less than 300 scfm and a high flow burner ring that operates simultaneously with the low flow burner tip to combust landfill gas flows of between 300 and 2000 scfm. The flare flame zone temperature is maintained at 1500 °F at low flow conditions and 1600 °F at high gas flow conditions by sensing the temperature with a thermocouple and sending this signal through a controller to adjust the amount of excess air fed to the flame zone with a series of three air inlet louvers located at the base of the flare enclosure.

CONDITIONS:

## 9.A Standard Administrative Conditions

A.1 **Condition Acceptance.** Acceptance of this operating permit by the permittees [1] shall be considered as acceptance of all terms, conditions, and limits of this permit. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.2 **Grounds for Revocation.** Failure to abide by and faithfully comply with this permit shall constitute grounds for revocation pursuant to California Health & Safety Code Section 42307 *et seq.* [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.3 **Defense of Permit.** The permittees agree, as a condition of the issuance and use of this permit, to defend at its sole expense any action brought against the APCD because of issuance of this permit. The permittees shall reimburse the APCD for any and all costs including, but not limited to, court costs and attorney's fees which the APCD may be required by a court to pay as a result of such action. The APCD may, at its sole discretion, participate in the defense of any such action, but such participation shall not relieve the permittees of their obligation under this condition. The APCD shall bear its own expenses for its participation in the action. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

[1] The term "permittees" as used in Section 9.0 refers to compliance responsibility for each condition assigned to NEO Tajiguas LLC, MM Tajiguas Energy LLC, and/or the Santa Barbara County Public Works Department as noted in Table 9.2

A.4 **Reimbursement of Costs**. All reasonable expenses, as defined in APCD Rule 210, incurred by the APCD, and APCD contractors, and legal counsel for the activities listed below that follow the issuance of this permit, including but not limited to permit condition implementation, compliance verification and emergency response, directly and necessarily related to enforcement of the permit shall be reimbursed by the permittees as required by Rule 210. Reimbursable activities include work involving: Part 70 Federal Operating permit program, CEMS, modeling/AQIA, ambient air monitoring, DAS and data telemetry. Not withstanding the above, DAS system operation and maintenance shall be assessed fees based on a fee schedule as provided by the APCD. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.5 **Compliance.** Nothing contained within this permit shall be construed to allow the violation of any local, State or Federal rule, regulation, ambient air quality standard or air quality increment. [*Re: ATC 9788, ATC 9788-01, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788*

A.6 **Consistency with Analysis.** Operation under this permit shall be conducted consistent with all data, specifications and assumptions included with the application and supplements thereof (as documented in the APCD's project file) and the APCD's analyses under which this permit is issued. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.7 **Consistency with State and Local Permits.** Nothing in this permit shall relax any air pollution control requirement imposed on the project by the County of Santa Barbara in the Tajiguas Project Final Development Plan No. 93-FDP-015 and any subsequent modifications. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.8 **Equipment Maintenance.** All equipment permitted herein shall be properly maintained and kept in good working condition in accordance with the equipment manufacturer specifications at all times. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.9 **Conflict Between Permits.** The requirements or limits that are more restrictive from an air quality stand point shall apply if any conflict arises between the requirements and limits of this permit and any other individual permit(s) issued by the APCD for the Tajiguas facility. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.10 **Complaint Response.** The permittees shall provide the APCD with the current name and position, address and 24-hour phone number of a contact person who shall be available to respond to complaints from the public concerning nuisance or odors. This contact person shall aid the APCD staff, as requested by the APCD, in the investigation of any complaints received, the permittees shall take corrective action, to correct the facility activity which is reasonably believed to have caused the complaint. [*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788]*

A.11 **Compliance with Permit Conditions.**

(a) The permittees shall comply with all permit conditions.

(b) This permit does not convey property rights or exclusive privilege of any sort.

(c) Noncompliance with any permit conditions is grounds for permit termination, revocation and re-issuance, modification, enforcement action, or for denial of permit renewal. Any permit non-

compliance constitutes a violation of the Clean Air Act and its implementing regulations or of APCD Rules or both, as applicable.

(d) The permittee shall not use the "need to halt or reduce a permitted activity in order to maintain compliance" as a defense for noncompliance with any permit condition.

(e) A pending permit action or notification of anticipated noncompliance does not stay any permit condition.

(f) Within a reasonable time period, the permittees shall furnish any information requested by the Control Officer, in writing, for the purpose of determining:

(i) compliance with the permit, or
(ii) whether or not cause exists to modify, revoke and reissue, or terminate a permit or for an enforcement action.

(g) In the event that any condition herein is determined to be in conflict with any other condition contained herein, then, if principles of law do not provide to the contrary, the condition most protective of air quality and public health and safety shall prevail to the extent feasible.

[*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, PTO 9788, 40 CFR Part 70.6.(a)(6), APCD Rule 1303.D.1]*

A.12 **Emergency Provisions.** The permittees shall comply with the requirements of the APCD, Rule 505 (Upset/Breakdown rule) and/or APCD Rule 1303.F, whichever is applicable to the emergency situation. In order to maintain an affirmative defense under Rule 1303.F, the permittees shall provide the APCD, in writing, a "notice of emergency" within 2 working days of the emergency. The "notice of emergency" shall contain the information/documentation listed in Sections (1) through (5) of Rule 1303.F. [*Re: 40 CFR 70.6(g), APCD Rule 1303.F* ]

A.13 **Compliance Plans.**

(a) The permittees shall comply with all federally enforceable requirements that become applicable during the permit term in a timely manner.

(b) For all applicable equipment, the permittees shall implement and comply with any specific compliance plan required under any federally-enforceable rules or standards.

[*Re: APCD Rule 1302.D.2*]

A.14 **Right of Entry.** The Regional Administrator of USEPA, the Control Officer, or their authorized representatives, upon the presentation of credentials, shall be permitted to enter upon the premises where a Part 70 Source is located or where records must be kept:

(a) To inspect the stationary source, including monitoring and control equipment, work practices, operations, and emission-related activity;

(b) To inspect and duplicate, at reasonable times, records required by this Permit to Operate;

(c) To sample substances or monitor emissions from the source or assess other parameters to assure compliance with the permit or applicable requirements, at reasonable times. Monitoring of emissions can include source testing.

[*Re: APCD Rule 1303.D.2*]

A.15 **Severability.** The provisions of this Permit to Operate are severable and if any provision of this Permit to Operate is held invalid, the remainder of this Permit to Operate shall not be affected thereby. [*Re: APCD Rules 103 and 1303.D.1*]

A.16 **Payment of Fees.** The permittees shall reimburse the APCD for all its Part 70 permit processing and compliance expenses for the stationary source on a timely basis. Failure to reimburse on a timely basis shall be a violation of this permit and of applicable requirements and can result in forfeiture of the Part 70 permit. Operation without a Part 70 permit subjects the source to potential enforcement action by the APCD and the USEPA pursuant to section 502(a) of the Clean Air Act. [*Re: APCD Rules 1303.D.1 and 1304.D.11, 40 CFR 70.6(a)(7)*]

A.17 **Prompt Reporting of Deviations.** The permittees shall submit a written report to the APCD documenting each and every deviation from the requirements of this permit or any applicable federal requirements within 7 days after discovery of the violation, but not later than 6 months after the date of occurrence. The report shall clearly document 1) the probable cause and extent of the deviation, 2) equipment involved, 3) the quantity of excess pollutant emissions, if any, and 4) actions taken to correct the deviation. The requirements of this condition shall not apply to deviations reported to APCD in accordance with Rule 505, Breakdown Conditions, or Rule 1303.F Emergency Provisions. [*APCD Rule 1303.D.1, 40 CFR 70.6(a) (3)*]

A.18 **Reporting Requirements/Compliance Certification.** The permittees shall submit compliance certification reports to the USEPA and the Control Officer every six months. These reports shall be submitted on APCD approved forms and shall identify each applicable requirement/condition of the permit, the compliance status with each requirement/condition, the monitoring methods used to determine compliance, whether the compliance was continuous or intermittent, and include detailed information on the occurrence and correction of any deviations from permit requirement. The reporting periods shall be each half of the calendar year, e.g., January through June for the first half of the year. These reports shall be submitted by September 1st and March 1st, respectively, each year. Supporting monitoring data shall be submitted in accordance with the "Semi-Annual Compliance Verification Report" condition in Section C. The permittees shall include a written statement from the responsible official, which certifies the truth, accuracy, and completeness of the reports. [*Re: APCD Rules 1303.D.1, 1302.D.3, 1303.2.c*]

A.19 **Federally Enforceable Conditions.** Each federally enforceable condition in this permit shall be enforceable by the USEPA and members of the public. None of the conditions in the APCD-only enforceable section of this permit are federally enforceable or subject to the public/USEPA review. [*Re: CAAA § 502(b)(6), 40 CFR 70.6(b)*]

A.20 **Recordkeeping Requirements**. The permittees shall maintain records of required monitoring information that include the following:

(a) The date, place as defined in the permit, and time of sampling or measurements;

(b) The date(s) analyses were performed;
(c) The company or entity that performed the analyses;
(d) The analytical techniques or methods used;
(e) The results of such analyses; and
(f) The operating conditions as existing at the time of sampling or measurement;

The records (electronic or hard copy), as well as all supporting information including calibration and maintenance records, shall be maintained for a minimum of five (5) years from date of initial entry by the permittees and shall be made available to the APCD upon request. [*Re: APCD Rule 1303.D.1.f, 40 CFR 70.6(a)(3)*]

## 9.B Generic Conditions

The generic conditions listed below apply to all emission units, regardless of their category or emission rates. These conditions are federally enforceable. These rules apply to the equipment and operations at Tajiguas, as they currently exist. Compliance with these requirements is discussed in Section 3.4.2. In the case of a discrepancy between the wording of a condition and the applicable APCD rule, the wording of the rule shall control.

B.1 **Circumvention (Rule 301).** A person shall not build, erect, install, or use any article, machine, equipment or other contrivance, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which would otherwise constitute a violation of Division 26 (Air Resources) of the Health and Safety Code of the State of California or of these Rules and Regulations. This Rule shall not apply to cases in which the only violation involved is of Section 41700 of the Health and Safety Code of the State of California, or of APCD Rule 303. [*Re: APCD Rule 301*]

B.2 **Visible Emissions (Rule 302).** Tajiguas shall not discharge into the atmosphere from any single source of emission any air contaminants for a period or periods aggregating more than three minutes in any one hour that is: [*See also Condition 9.C.2.(c)(vi)for air contaminants control]*

(a) As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or

(b) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection B.2.(a) above. [*Re: APCD Rule 302*]

B.3 **Nuisance (Rule 303).** No pollutant emissions from any source at Tajiguas shall create nuisance conditions. No operations shall endanger health, safety or comfort, nor shall they damage any property or business. [*Re: APCD Rule 303*]

B.4 **PM Concentration - South Zone (Rule 305).** Tajiguas shall not discharge into the atmosphere, from any source, particulate matter in excess of the concentrations listed in Table 305(a) of Rule 305. [*Re: APCD Rule 305*]

B.5 **Specific Contaminants (Rule 309).** Tajiguas shall not discharge into the atmosphere from any single source of emission sulfur compounds, combustion contaminants, nitrogen oxides and carbon monoxide in excess of the standards listed in Sections A, E and G of Rule 309. [*Re: APCD Rule 309*]

B.6 **Sulfur Content of Fuels (Rule 311).** Tajiguas shall not burn fuels with a sulfur content in excess of 0.5% (by weight) for liquid fuels and 239 ppmvd or 15 gr/100scf (calculated as $H_2S$) for gaseous fuels. Compliance with this condition shall be based on quarterly hydrogen sulfide and total sulfur content measurements of the fuel gas using ASTM or other APCD-approved methods and diesel fuel billing records or other data showing the certified sulfur content for each shipment. [*Re: APCD Rule 311*]

B.7 **Breakdowns (Rule 505).** The permittees shall promptly report: (a) breakdowns that result in violations of emission limitations or restrictions prescribed by APCD Rules or by this permit, or (b)

any in-stack, continuous monitoring equipment breakdowns; such reporting shall be made in conformance with the requirements of Rule 505, Sections A, B1 and D. [*Re: APCD Rule 505*]

## C. Equipment Specific Conditions

Federally-enforceable conditions, including emissions and operations limits, monitoring, recordkeeping and reporting are included in this section for each specific group of equipment. This section may also contain other non-generic conditions.

The conditions below supersede the same conditions in PTO 9788-R2. The attached Tables 5.1, 5.2, 5.3, 5.7, 5.8, and 5.9 supersede those in PTO 9788-R2. All other conditions in PTO 9788-R2 remain in full force and effect.

C.2 **IC Engine and Electrical Generator:** The following equipment is included in this emissions unit category:

Table 9.2-1: Equipment List

| EQ No. | Name |
|---|---|
| 06523 | IC Engine: LFG-fired, 4231 BHP, Caterpillar, Model G3616, SN 4CG00110; Electrical Generator: 3.1 MW; Kato, Model C087-0546, SN 13171-13 |
| | LFG Treatment System consisting of items (a) through (e) below: |
| 101990 | (a) Particulate Filter: 24" dia by 10' long, Jenco, SN 99-1746 |
| 101987 | (b) Gas Compressor: 300 hp, 2000 scfm ; Vilter, Model Vss-1801 AO25235, SN H82142 |
| 101991 | (c) Oil Filter: 24" dia.,255 psig & 300° F; Jenco, SN 99-1746-2 |
| 101992 | (d) Gas Cooler: 8' by 4' by 14'; Air-X-Changer, Model 93AH, SN 982223 |
| 101993 | (e) Coalescing Filter: 18" dia by 10' long; Jenco, SN 98-102-001 |
| 101996 | Tank: DI-Water/Coolant, 1,000 gallons, steel-walled |
| 101994 | Tank: New Oil Tank, 1,000 gallons, steel-walled |
| 101995 | Tank: Waste Oil Tank, 1,000 gallons, steel-walled |

(a) Emission Limits: Mass emissions from the electrical generator IC engine listed above shall not exceed the limits listed in Table 5.3. Compliance with this condition shall be based on the monitoring, recordkeeping and reporting conditions in this permit.

$NO_x$, ROC, $PM_{10}$, CO BACT Limits/ Performance Standard –Except for 15-minute periods of startup or shutdown, the IC engine shall not exceed the following BACT emission limits or performance standards:

Table 9.2-2: Emission Limits/Performance Standards

| Pollutant | Emission Limit/Performance Standard |
|---|---|
| $NO_x$ | Emission Limit:<br>1) 113 ppmv $NO_x$ in IC engine exhaust, corrected to 3% exhaust oxygen<br>Performance Standards:<br>2) 0.149 lb/MMBtu of total landfill fuel combusted in engine; or<br>3) 0.53 g/bhp-hr |
| ROC | Emission Limit:<br>1) 20 ppmv NMOC (15 ppmv ROC) as hexane, corrected to 3% exhaust oxygen.<br>Performance Standards:<br>2) 0.061 lb/MMBtu of total landfill fuel combusted in engine; or<br>3) 0.216 g/bhp-hr |
| $PM_{10}$ | Emission Limit & Performance Standard:<br>1) 0.066 g/bhp-hr of landfill fuel combusted in engine, if tested for compliance at rated full load (>3050 kw generator gross output). At all other loads, standard is 0.0187 lb/MMBtu heat input to the engine. |
| CO | Emission Limit & Performance Standards:<br>1) 2.1 g/bhp-hr; or<br>2) 0.594 lb/MMBtu |

(b) Operational Limits: The following operational limits apply to the electrical IC engine/generator set as specified:

(i) *IC Engine/Electrical Generator Load* - Except for startup and shutdown periods, the electrical generator shall operate at a minimum load of 2,790 kW based on a 3-hour rolling clock average.

In the event the IC Engine should operate at generator loads less than 2,790 kW for more than 3 consecutive rolling clock average hours, the engine shall be shut down and all the collected LFG shall be flared until the causes of the low load condition are corrected. When IC Engine operations are restarted, a load of at least 2,790 kW shall be achieved within 15 minutes of IC Engine startup [30 minutes for a cold start-up, see Condition 9.C.2 (b) (vii)] or the IC Engine shall be shutdown. This minimum generator load condition is required to ensure the IC engine's NMOC destruction efficiency is maintained.

(ii) *Control Efficiency* – As a control device, the IC engine shall either reduce NMOC in the incoming LFG processed by 98 weight percent, or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen.

(iii) *IC Engine Heat Input Limits* – Tajiguas shall comply with the following heat input limits (fuel use and fuel HHV based):

- IC Engine: 44.80 MMBtu/hr; 1075.20 MMBtu/day; 98,112 MMBtu/quarter; 392,448 MMBtu/year.

(iv) *IC Engine Fuel Gas— Sulfur Limit* – Tajiguas shall use LFG at all time for the IC engine in the electrical generator set. The landfill fuel gas shall not contain total sulfur compounds in concentrations exceeding 100 ppmvd (calculated as $H_2S$ at standard

conditions). Compliance shall be based on monitoring and recordkeeping requirements of this permit as well as APCD inspections.

(v) *IC Engine BACT Technology* -- The project shall apply BACT emission control and plant design measures to the operation of the IC Engine/electrical generator equipment unit as described in Section 4.3 and Table 4.1 of this permit. BACT measures for this equipment shall be in place and operational at all times for the life of the project as follows:

Table 9.2-3: Applicable BACT List

| Pollutant | Control Technology |
|---|---|
| $NO_x$ | 1) Fuel/Air Ratio Controller;<br>2) Spark/Torch Timing and Duration Controls; and<br>3) Turbocharged and intercooled induction air system to increase engine efficiency and lower induction air temperature; |
| ROC | 1) Same as for IC engine $NO_x$ controls described above |
| $PM_{10}$ | 1) LFG-conditioning system including gas condensate scrubber and gas filter to remove course particulates. |
| CO | 1) Emissions of no more than 2.1 g/bhp-hr. |

(vi) *IC Engine Operations* – The IC engine shall operate at all times when the collected LFG is routed to the engine. Also, all operational limits specified in paragraphs 9.C.2 (b) (i) through (v) above apply at all times, except during periods of start-up, shutdown, or malfunction. The duration of such periods of start-up or shutdown shall not exceed 15 minutes, and malfunction periods shall not exceed 1 hour; unless either the flare unit at Tajiguas is operating concomitantly to control the total NMOC/LFG collected at the landfill or the LFG collector-blower at the landfill is not operating. The start-up time for a 'cold' start-up event will be 30 minutes, per the manufacturer's guideline. A cold start-up event is defined as an engine start-up when the engine oil temperature is below 122 °F. All cold start-up events shall be demarcated as such by the operator by recording the engine oil temperature just before the start-up commences. [see also Condition 9.C.2.(c)(vi)]

(vii) *The Treatment System Operation* – As required by 40 CFR §60.753 (f), the LFG treatment system (as listed in table 9.2-1 above) shall be operable and operated at all times when the collected gas is routed to the treatment system.

(viii) *IC Engine Operating Temperature* – The IC engine shall not operate for a three hour period (block-averaged with three hours of 'valid' data) at an exhaust temperature (measured at the exhaust manifold) more than 50 °F below the observed average temperature during the most recent source performance test, that showed compliance with all emission limits.

(ix) *Allowed IC Engine Operating Temperature Variation* – The IC engine's exhaust temperature (measured at the exhaust manifold) shall also not vary by more than +15 percent or - 5 percent from the temperature set per the latest compliant source test average temperature, for any period longer than 60 minutes (based on all consecutive 15-minute

readings obtained over the 60-minute span). As an alternative to the allowable temperature range as stated above, the permittee may establish a new compliance temperature range based on multiple source tests demonstrating compliance with NOx, NMOC/ROC and CO emission limits over that range. A portable analyzer may be used in accordance with APCD-approved protocol for demonstrating compliance with NOx and CO limits at the higher temperature when such higher temperature cannot be pre-set at the time of annual compliance source tests. The new compliant temperature range shall take effect upon the APCD's written approval.

(a) Monitoring: The equipment in this section is subject to the following monitoring requirements:

(i) *Engine/Generator Parameters* – Engine hours of operation, and generator megawatt output shall be continuously monitored by APCD approved monitoring devices calibrated and maintained per the *Process Monitor Calibration and Maintenance Plan*. The three-hour generator load data must comprise three consecutive hours of valid data; and, each "hour of valid data" shall have measured values for at least three 15-minute monitoring periods during that hour. A circular chart, or a strip chart, or any other APCD-approved method of tracking the actual load shall be used [see 40 CFR 63.1965 (b)].

(ii) *IC Engine Fuel Gas Analysis* – A sample of LFG fuel gas shall be extracted after the compressor station on a calendar quarterly basis and analyzed for NMOC, ROC, total sulfur compounds, hydrogen sulfide and high and lower heating values.

(iii) *NMOC Control Efficiency* – Annual source testing per Condition 9.C.7 shall be required to verify NMOC control efficiency.

(iv) *Enhanced Inspection and Maintenance Program* - The EI&M Program shall be implemented in accordance with the APCD approved EI&M Plan and any updates thereof for the life of the project. Table 4.4 summarizes the minimum parameters required to be monitored by this Plan. The data obtained through this Plan shall be used by the APCD, alone or in combination with other data, to verify and enforce permit conditions.

(v) *Process Monitoring Systems* - All IC engine process monitoring devices listed in Section 4.7.2 shall be properly operated, maintained, and calibrated according to the *Process Monitor Calibration and Maintenance Plan* including:

⇒ Engine Fuel Flow Meter/Recorder
⇒ Engine Hour Meter
⇒ Portable $NO_x$ , CO, and $O_2$ Monitor
⇒ Engine Stack Temperature Monitor

(vi) *IC Engine BACT Monitoring* – The permittees shall continuously verify the effectiveness and monitor the operation of BACT as on the following schedule:

Table 9.2-4: Record-keeping Requirements

| Pollutant | Verification / Recordkeeping Requirements |
|---|---|
| $NO_x$ | 1) Weekly monitoring of IC engine exhaust using a portable NOx analyzer or equivalent APCD-approved device, and Enhanced I&M Plan. Annual emissions source testing.<br>2) Annual emissions source testing of ICE exhaust. |
| ROC | 1) Enhanced I&M Plan inspections of engine exhaust; monitoring and recording of engine exhaust temperature and engine load.<br>2) Annual emissions source testing of ICE exhaust. |
| $PM_{10}$ | 1) Annual emissions source testing of IC engine exhaust to atmosphere. |
| CO | 1) Enhanced I&M monitoring.<br>2) Annual emissions source testing of IC engine exhaust to atmosphere. |

The operator shall log all 'cold' start-up events and include (a) total start-up time for the event, and (b) the engine oil temperature recorded just before the start-up commences, for each cold start-up event.

(vii) *IC Engine NESHAP (Subpart AAAA) Monitoring for ICE Temperature and LFG Flow* – Except for startup, shutdown, and malfunction periods, the ICE exhaust temperature and the LFG flow to the engine shall be continuously monitored with the data to be logged in every fifteen minutes, at a minimum. Each hour's temperature and flow data must qualify as valid data; that is, each "hour of data" shall have measured values for at least three 15-minute monitoring periods during that hour. The monitoring shall use APCD approved monitoring devices – calibrated and maintained per APCD-approved Process Monitor Calibration and Maintenance Plan.

(d) Recordkeeping: Recordkeeping required in this section is subject to the recordkeeping requirements found in Condition C.5 of this permit, in NSPS 40 CFR 60 Subpart WWW Standards of Performance for Municipal Solid Waste Landfills §60.758, in NSPS 40 CFR 63 Subpart AAAA National Emission Standards for Hazardous Pollutants for MSW Landfills §63.1980 and in the plans listed above. Compliance with this condition is evidenced by the following recordkeeping:

(i) *Engine/Generator Parameters* – (a) Hourly records of engine fuel flow in scf and engine operating temperature in °F (as recorded every 15 minutes or more frequently and averaged) and (b) average generator megawatt output in megawatt-hours shall be maintained. The maximum engine fuel use in scfm, the minimum and maximum observed temperatures and the minimum generator megawatt output during the day shall be flagged.

(ii) *IC Engine Fuel Gas Analysis* – Results of laboratory analysis of quarterly LFG samples extracted and analyzed for NMOC, ROC, total sulfur compounds, hydrogen sulfide and

high and lower heating values shall be maintained.

(iii) *Control Efficiency* – Records shall be maintained documenting compliance with control efficiency of the control device to comply with 40 CFR 60.758 (b) (1) (ii) and 40 CFR 63.1980 (a) and (b). All 'cold' start-up events shall be recorded, per Condition 9.C.2.(c)(vi).

(iv) *Enhanced Inspection and Maintenance Program* – Weekly records of engine exhaust parameters ($NO_x$, $O_2$, exhaust temperature, and engine load) and engine-operating parameters (intake air temperature, ignition timing, and air-to-fuel ratio control settings) shall be maintained as required by the EI&M Plan.

(e) Reporting: The reporting required in this section is subject to the reporting requirements found in NSPS 40 CFR subpart WWW Standards of Performance for Municipal Solid Waste Landfills §60.757 and in the plans listed above. A calendar quarterly and annual report detailing the operation activities shall be provided to the APCD per Condition 9.C.6 of PTO 9788-R2.*[Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, ATC/PTO 10935, 40 CFR 60 Subpart WWW and 40 CFR 63 Subpart AAAA]*

C.3 **LFG Flare.** The following equipment is included in this emissions unit category:

Table 9.3-1: Equipment List

| EQ No. | Name |
|---|---|
| 101983 | Flare: Low Flow (0-300 scfm), 9 MMBtu/hr, 96" dia, 45' tall; LFG Specialties, Model EF 945110, SN 1734 |
| 006524 | Flare: High Flow (300-2000 scfm), 54.68 MMBtu/hr, 96" dia, 45' tall; LFG Specialties, Model ERA 84018, SN 1519-M2 |

(a) Emission Limits: Mass emissions from the flare system listed above shall not exceed the limits listed in Tables 5.3. Compliance with this condition shall be based on the monitoring, recordkeeping and reporting conditions in this permit.

$NO_x$, ROC, $PM_{10}$, CO BACT Limits/ Performance Standard –Except for 15-minute periods of startup or shutdown, the enclosed flare shall not exceed the following BACT emission limits or performance standards. The enclosed flare is comprised of a low flow burner tip to combust gas flow rates up to 300 scfm and a high flow burner arrangement to combust gas flow rates from 300 to 2000 scfm. The low flow burner operates in conjunction with the high flow burner during high flow operation of the flare. BACT requirements for the enclosed ground flare apply in both the high flow mode and the low flow mode as follows:

Table 9.3-2: Emission Limits/Performance Standards

| Pollutant | Emission Limit / Performance Standard |
|---|---|
| $NO_x$ | Emission Limit:<br>1) 35 ppmv $NO_x$ in Flare exhaust, corrected to 3% exhaust oxygen.<br>Performance Standard:<br>2) 0.048 lb/MMBtu of landfill fuel combusted in Flare. |
| ROC | Emission Limit:<br>1) 15 ppmv ROC as hexane, corrected to 3% exhaust oxygen in Flare exhaust.<br>Performance Standard:<br>2) 0.038 lb/MMBtu of total landfill fuel combusted in Flare. |

(b) Operational Limits: The following operational limits apply to the enclosed LFG flare as specified:

(i) *Enclosed Flare Operation* - The flare, in its low- or high-flow modes, shall operate at temperatures equal to or higher than the recorded 'low- or high-flow mode' average temperatures observed during the latest annual source testing at which compliance was obtained with all permit-stipulated emission limits. However, in no case shall the flare operate below a minimum flare temperature of 1400 °F, hourly averaged, when operated under low-flow conditions (gas flow below 300 scfm) and a flare temperature of 1500 °F, hourly averaged, when operated under high-flow conditions (gas flows between 300 and 2000 scfm). The hourly averaged reading shall be obtained, at a minimum, from four readings at 15 minute intervals. Note that no source testing for the flare can be performed at 'hourly averaged' temperatures below the above-stated minimum of 1400 °F for the low-flow mode and 1500 °F for the high-flow mode.

The only exception to this stipulation shall be allowed for startup and shutdown periods involving the light-off of the enclosed ground flare pilot and malfunction periods (see also Condition 9.C.3. (b)(v) below).

The flare temperature controller, for low-flow or high-flow modes, shall be set at temperature set-points that are 50 °F above the compliant source test temperatures (see also Condition 9.C.3.(b)(iv) below for allowed operating temperature deviations).

(ii) *Gas Flow to Flare* - All collected LFG shall be delivered to the enclosed ground flare for combustion and NMOC control purposes, except as authorized for use in an IC engine powered generator as permitted. Total LFG flow to the flare shall not exceed 2000 scfm at any time.

(iii) *Control Efficiency* – The flare shall either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen.

(iv) *Combustion Temperature Deviation* – (a) As required by 40 CFR 60.758 (c) (1) (i), the flare shall not operate, in either the low-flow mode or the high-flow mode, for any "three continuous hour periods" at average combustion temperatures more than 50 °F below the average temperatures established during the most recent compliant source performance test for the two modes ; and (b) the flare unit's combustion temperature shall not vary by more than +10 percent or -5 percent from the temperature set per compliant source test

temperatures (per 9.C.2.(b)(i) above) for any period longer than 60 minutes (based on all consecutive 15-minute readings obtained over the 60-minute span). As an alternative to the allowable temperature range per 9.C.2.(b)(i) above, the permittee may establish a new compliance temperature range based on multiple source tests demonstrating compliance with NOx, NMOC/ROC and CO emission limits over that range. Such testing shall be done in accordance with APCD-approved protocol and shall adhere to Condition 9.C.7 (Source Testing). The new compliant temperature range shall take effect on APCD's written approval.

(v) *Flare Downtime* - The enclosed ground flare system shall operate at all times when the collected LFG is routed to the flare system. Also, all operational limits specified in paragraphs 9.C.3 (b) (i) above through (vii) below apply at all times, except during periods of start-up, shutdown, or malfunction. The duration of such periods of start-up or shutdown shall not exceed 15 minutes, and malfunction periods shall not exceed 1 hour; unless, either the IC engine unit at Tajiguas is operating concomitantly to control the total NMOC/LFG collected at the landfill or the LFG collector-blower at the landfill is not operating.

(vi) *Enclosed Flare Heat Input Limits* – The permittee shall comply with the following heat input limits (fuel use and fuel HHV based):

- High-Flow Flare: 54.68 MMBtu/hr; 1312.32 MMBtu/day; 119,749 MMBtu/quarter; 478,997 MMBtu/year.
- Low-Flow Flare: 8.19 MMBtu/hr; 196.56 MMBtu/day; 17,936 MMBtu/quarter; 71,744 MMBtu/year.

(vii) *Enclosed Flare BACT Technology* - The project shall apply emission control and plant design measures that represent Best Available Control Technology (BACT), to the operation of the Enclosed Ground Flare equipment unit as described in Section 4.4 and Tables 4.2 and 4.3 of this permit. BACT measures for this equipment shall be in place and operational at all times for the life of the project.

Table 9.3-3 BACT Requirements

| Pollutant | Control Technology |
|---|---|
| $NO_x$ | 1) Burner design. |
| ROC | 1) Enclosed flare operating with minimum residence time of 0.24 seconds at 1500 °F temperature and 0.88 seconds at 1400 °F[2]. |
| CO | 1) Enclosed flare operating with minimum residence time of 0.24 seconds at 1500 °F temperature and 0.88 seconds at 1400 °F[1]. |

(viii) *Landfill Condensate* – Introduction of landfill condensate into the enclosed flare for destruction shall not exceed 0.5 gallon per minute.

[2] Except as allowed under condition C.3 (b) (i) and (b) (iv).

(c) Monitoring: The equipment in this section is subject to all the monitoring requirements listed in APCD Rule 341.F. In addition, the following monitoring requirements apply to the flare relief system:

(i) *Enclosed Flare Parameters* – High-flow and low-flow flare, hours of operation, and combustion temperature on an hourly average, with fifteen minute interval readings at a minimum, shall be continuously monitored and recorded by APCD approved monitoring devices calibrated and maintained per the *Process Monitor Calibration and Maintenance Plan.*

(ii) *Combustion Temperature Monitoring* – Combustion temperature data shall be monitored for the flare operation and recorded in three continuous hour increments. Each hourly data must comprise of valid data; that is, each "hour of valid data" shall have measured values for at least three 15-minute monitoring periods during that hour. A circular chart, or a strip chart, or any other APCD-approved method of tracking the actual temperature shall be used [see 40 CFR 63.1965 (b)].

(iii) *Enclosed Flare Fuel Gas Analysis* – A sample of LFG shall be extracted at the blower inlet (or outlet) on a calendar quarterly basis and analyzed for NMOC, ROC, total sulfur compounds, hydrogen sulfide and high and lower heating values.

(iv) *Process Monitoring Systems* - All enclosed flare process monitoring devices listed in Section 4.7.2 shall be properly operated, maintained, and calibrated according to the *Process Monitor Calibration and Maintenance Plan* including:

⇒ Flare flow meter/recorder (SN 192662)
⇒ Enclosed Flare Incineration Zone Temperature Indicator(s) and Recorder
⇒ LFG Condensate Injection Flow (gallons) Metering/Recording Equipment
⇒ Landfill Condensate Monitoring and Lockout System

(v) *Control Efficiency* – Compliance with control efficiency requirement shall be established through annual source testing.

(vi) *Enclosed Flare BACT Monitoring* – The permittees shall continuously verify the effectiveness and monitor the operation of BACT for the low and high flow flare as on the following schedule:

| Pollutant | Verification / Recordkeeping Requirements |
|---|---|
| $NO_x$ | 1) Annually, during source testing of flare exhaust to atmosphere. |
| ROC | 1) Continuous monitoring and recording of flare temperature.<br>2) Annual emissions source testing of flare exhaust to atmosphere. |

(vii) *Flare NESHAP (Subpart AAAA) Monitoring for LFG Flow* – Except for startup and shutdown periods of no more than 15 minutes duration, and malfunction periods of no more than 1 hour duration, the LFG flow to the flare system shall be continuously monitored with the flow rate data logged in every fifteen minutes, at a minimum. The monitoring shall use APCD-approved monitoring devices – calibrated and maintained per APCD-

approved Process Monitor Calibration and Maintenance Plan.

(viii) *Landfill Condensate* – Condensate injection rate shall be continuously monitored by APCD approved condensate injection system monitoring devices calibrated and maintained per the *Process Monitor Calibration and Maintenance Plan*

(d) Recordkeeping: Recordkeeping required in this section is subject to the recordkeeping requirements found in Condition C.5 of this permit and in NSPS 40 CFR subpart WWW Standards of Performance for Municipal Solid Waste Landfills §60.758 and in the plans listed above. Compliance with this condition is evidenced by the following recordkeeping:

(i) *Enclosed Flare Parameters* – Daily records of flare fuel flow in scf, hours of operation and maximum flare fuel use in scfm shall be maintained.

(ii) *Enclosed Flare Fuel Gas Analysis* – Results of laboratory analysis of quarterly LFG samples extracted and analyzed for NMOC, ROC, total sulfur compounds, hydrogen sulfide and high and lower heating values shall be maintained.

(iii) *Control Efficiency* – Records shall be maintained documenting compliance with control efficiency of the flare to comply with 40 CFR 60.758 (b) (1) (ii).

(iv) *Enclosed Flare Combustion Temperature* – Records of average combustion temperature measured at least every 15 minutes and averaged over an hour and the daily minimum flare combustion temperature shall be maintained.

(v) *Combustion Temperature Deviation* – Records of combustion temperature data collected in C.3 (d) (iv) above shall be maintained for the flare operation for three continuous hour periods. Records of deviations from 9.C.3. (b)(i), read along with 9.C.3. (b)(iv), shall be logged and recorded.

(vi) *Landfill Condensate*- Records of maximum daily condensate injection rate in gpm and total daily condensate injected in gallons shall be maintained.

(e) Reporting: The reporting required in this section is subject to the reporting requirements found in NSPS 40 CFR subpart WWW Standards of Performance for Municipal Solid Waste Landfills §60.757 and in the plans listed above. A semi-annual and annual report detailing the operation activities shall be provided to the APCD per Condition 9.C.6 of PTO 9788-R2 .

[*Re: ATC 9788, ATC/PTO 9788, ATC 9788-03, ATC 9788-04, ATC/PTO 10935*

## D. APCD-Only Conditions

The following section lists permit conditions that are not enforceable by the USEPA or the public. However, these conditions are enforceable by the APCD and the State of California. These conditions are issued pursuant to APCD Rule 206 (*Conditional Approval of Authority to Construct or Permit to Operate*

D.1 **Permit Activation.** All aspects of this permit are enforceable by the APCD and the State of California upon the issuance date stamped below. The Part 70 aspects of this permit are not final until:

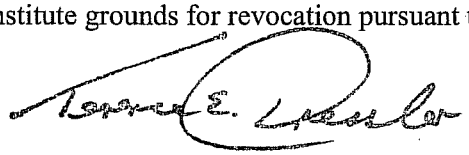
(a) The USEPA has provided written comments to the APCD and these comments require no modification to this permit. The APCD will issue a letter stating that this permit is a final Part 70 permit. The effective date that this permit will be considered a final Part 70 permit will be the date stamped on the APCD's letter.

(b) After the USEPA has provided the APCD written comments that require a modification to this permit, the APCD will modify this permit to address the USEPA's comments and issue the Part 70 permit as final. The re-issued permit will supersede this permit in its entirety.

D.2. **Compliance**. Nothing contained within this permit shall be construed as allowing the violation of any local, state or federal rules, regulations, air quality standards or increments.

D.3. **Severability**. In the event that any condition herein is determined to be invalid, all other conditions shall remain in force.

D.4 **Grounds for Revocation**. Failure to abide by and faithfully comply with this permit or any Rule, Order, or Regulation may constitute grounds for revocation pursuant to California Health & Safety Code Section 42307 et seq.



AIR POLLUTION CONTROL OFFICER

JUL 15 2009

DATE

Reevaluation Due Date: July 2009

Attachment: Permit Evaluation for ATC/PTO 13002

Santa Barbara County
Air Pollution Control District

# PERMIT EVALUATION for AUTHORITY to CONSTRUCT/PERMIT to OPERATE No. 13002 and PART 70 MINOR MODIFICATION NO. 13002



## 1.0 BACKGROUND

1.1 General: This ATC/PTO authorizes an increase in the maximum heat input to the generator IC engine and the enclosed ground flare at the Tajiguas landfill. It also changes the minimum residence time requirement of the current PTO. A source test performed on April 22, 2008 showed that the heat input to the IC engine and to the flare in low flow mode exceeded the permitted limits and the residence time of the flare in low flow mode was less than the permitted limit. NOVs 9189, 9190, and 9291 were issued for these violations. The increased heat input and decreased residence time are due to an increase in the heat content F factor of the landfill gas. Because the heat content and F factor of the gas have increased over time, the assumptions made when the PTO was originally issued are no longer valid. This permit revises the heat input assumptions, which directly result in increases to lb/hr emission limits of all pollutants except for SOx. The minimum required residence time analysis is described in section 2.6 below.

Variance # 36-08-R was obtained to allow operation while this ATC/PTO was being evaluated. The application for this permit was submitted on November 26, 2008.

Refer to Pt 70 PTO 9788 R2 for a full description of operations at Tajiguas.

1.2 Permit History:

| PERMIT | FINAL ISSUED | PERMIT DESCRIPTION |
|---|---|---|
| PT-70/R 9788 R2 | 04/05/06 | Permit Reevaluation |
| ATC Mod 12191 01 | 07/27/07 | Change wash cycle duration and frequency on ATC 12191 |
| Trn O/O 9788 01 | 04/04/08 | Transfer of Ownership of MM Tajiguas LLC and NEO Tajiguas LLC from Algonquin to Fortistar |

1.3 Compliance History:

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 8705 | 12/29/2006 | Operating two wells out of compliance with wellhead oxygen levels specified in 40 CFR60.755.(a)(5) and Permit Condition 9.C.1.(b)(xii) of Part 70/APCD PTO-9788-R-2 for a period greater than 120 days. |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 8706 | 12/29/2006 | Failing to perform monthly sampling of the temperature, pressure and oxygen content at each wellhead as required by Permit Condition 9.C.1.(c)(vi) of Part 70/APCD PTO-9877-R-2. |
| NOV | 8704 | 12/29/2006 | Landfill gas exceeded the 100 ppmv H2S concentration limitation specified in conditions 9.C.1.(b)(iii) and 9.C.2.(b)(v) of Part 70/APCD PTO-9788-R2. |
| NOV | 8707 | 12/29/2006 | Failing to operate the IC engine/generator at loads greater than 90 percent of rated generator power rating or at loads greater than 2790 KW, as required by Permit Condtion 9.C.2(b)(ii) of Part 70/APCD Permit To Operate 9788-R2. |
| NOV | 8708 | 12/29/2006 | Operating the IC engine with an exhaust temperature that varied greater than +15 percent (981 degrees F) or -5 percent (810 degrees F) for a period longer than 60 minutes from the temperature set per the most recent source test, as limited by Permit Condtion 9.C.2(b)(x). |
| NOV | 8709 | 12/29/2006 | Failing to use a portable emissions monitoring instrument per the Enhanced Inspection and Monitoring (EI&M) program, as required by Permit Condition 9.C.2.(c)(iv) of Part 70/APCD PTO-9788-R-2. |
| NOV | 8710 | 12/29/2006 | Failing to continuously monitor the landfill gas (LFG) going to the IC engine, as required by Conditions 9.C.2.(c)(vii); and, for failing to properly operate and maintain all IC engine process monitors (including the LFG fuel flow meter and recorder), as required by Condition 9.C.2.(c)(v) of Part 70/APCD PTO-9788-R-2. |
| NOV | 8711 | 12/29/2006 | Failing to comply with Permit Condition 9.C.3(b)(iv) of Part 70/APCD PTO-9788-R-2 by operating the low-flow flare for more than three (3) continuous hour periods at a temperature of 50 degrees F below the average temperature maintained during the last compliant source test; as well as, operating the flare at temperatures more than +10 percent (1,580 F) or -5 percent (1,400 F) from the temperature set per the most recent source test for a period longer than 60 minutes. |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 8712 | 12/29/2006 | Failing to comply with Permit Condition 9.C.3 (b)(iv) of Part 70/APCD PTO-9788-R-2 by operating the high-flow flare for more than three (3) continuous hour periods at a temperature of 50 degrees F below the average temperature maintained during the last compliant source test; as well as, operating the flare at temperatures more than +10 percent (1,756 F) or -5 percent (1,516 F) from the temperature set per the most recent source test for a period longer than 60 minutes. |
| NTC | 8719 | 06/27/2007 | Failure to conduct the annual particulate matter compliance source test required in PTO-09788-R2 by the end of April 2007. |
| NOV | 8992 | 09/24/2007 | Exceeding the permitted total sulfur content (as H2S) of 100 ppmv in the landfill gas and in the IC engine fuel gas during October and December of 2006, based on 'Landfill Gas and Fuel Gas' analysis data submitted as part of a Compliance Verification Report for the second half of 2006 for Tajiguas Landfill. The two exceedances constitute violations of permit conditions 9.C.1.(b)(iii) and 9.C.2.(b)(v)) of Part 70/APCD PTO-9788-R2. |
| NOV | 8993 | 09/24/2007 | Operating two wells out of compliance with wellhead oxygen levels specified in 40CFR60.755.(a)(5) and Permit Condition 9.C.1.(b)(xii) of Part 70/APCD PTO-9788-R-2 for a period greater than 120 days. |
| NOV | 8994 | 09/24/2007 | Failing to operate the IC engine/generator at loads greater than 90 percent of rated generator power rating or at loads greater than 2790 KW, as required by Permit Condition 9.C.2(b)(ii) of Part 70/APCD Permit To Operate 9788-R-2. |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 8995 | 09/24/2007 | Failing to comply with Permit Condition 9.C.2.(ix) of Part 70/APCD PTO-9788-R2 by operating the IC engine for more than three continuous hour periods below the minimum operating temperature of 840 F on three days during the reporting period. |
| NOV | 8996 | 09/24/2007 | Operating the IC engine with an exhaust temperature that varied greater than +15 percent (1,024 degrees F) or -5 percent (846 degrees F) for a period longer than 60 minutes from the temperature set per the most recent source test (2006), as limited by Permit Condition 9.C.2(b)(x). |
| NOV | 8997 | 09/24/2007 | Failing to continuously monitor the IC engine exhaust temperature, as required by Condition 9.C.2.(c)(vii) of Part 70/APCD PTO-9788-R-2. |
| NOV | 8998 | 09/24/2007 | Failing to continuously monitor Landfill Gas (LFG) to the flare, as required by Condition 9.C.3.(c)(vii) of Part 70/APCD PTO-9788-R-2. |
| NOV | 8999 | 09/24/2007 | Failing to comply with Permit Condition 9.C.3(b)(iv) of Part 70/APCD PTO-9788-R2 by operating the low-flow flare for more than three (3) continuous hour periods at a temperature of 50 degrees F below the minimum low-flow flare operating temperature of 1,439 F on twenty-eight (28) days during the reporting period; and, the combustion temperature varying more than +10 percent (1,638 F) or -5 percent (1,415 F) on fifty-one (51) days during the reporting period. |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 9000 | 09/24/2007 | Failing to comply with Permit Condition 9.C.3(b)(iv) of Part 70/APCD PTO-9788-R2 by operating the high-flow flare for more than three (3) continuous hour periods at a temperature of 50 degrees F below the minimum high-flow flare operating temperature of 1,534 F on eleven (11) days during the reporting period; and, the combustion temperature varying more than +10 percent (1,742 F) or -5 percent (1,505 F) on twelve (12) days during the reporting period. |
| NTC | 9001 | 09/24/2007 | Failure to sample and report operational data (i.e., temperature, pressure and oxygen content) for each wellhead. CVR Section 6(a)(viii) reports monthly data of one or more parameters missing for all wells (2 months – August and December); TAJDW3-1, TAJDW3-2, TAJIGB07, TAJIGB25, TAJIGB43, and TAJIGB48 (1 month of missing data for each well); TAJIHZ3N (2 months of missing data) and TAJIGB33, TAJIGHZ2, TAJIGT02 (4 months of missing data for each well). |
| NOV | 9002 | 12/13/2007 | Failing to comply with Permit Condition 9.1.C.(c)(vi) of Part 70/PTO-9788-R2 by not collecting well monitoring data on a monthly basis. |
| NOV | 9003 | 12/13/2007 | Failing to operate the IC engine/generator at loads greater than 90 percent of rated generator power rating or at loads greater than 2790 KW, as required by Permit Condition 9.C.2.(b)(ii) of Part 70/PTO-9788-R2. |
| NOV | 9004 | 12/13/2007 | Failing to continuously monitor the IC engine exhaust temperature and the LFG flow to the ICE, as required by Condition 9.C.2.(c)(vii) of Part 70/PTO-9788-R2. |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 9005 | 12/13/2007 | Failing to comply with Permit Condition 9.C.3.(b)(iv) of Part 70/PTO-9788-R2 by operating the low-flow flare for more than three (3) continuous hour periods at a temperature of 50 degrees below the minimum low-flow flare operating temperature of 1,439 F on three (3) days during the reporting period; and, the combustion temperature varying more than +10 percent (1,638F) or -5 percent (1,415F) five hundred forty-five (545) times in fifty-one (51) days during the reporting period. |
| NOV | 9006 | 12/13/2007 | Failing to comply with Permit Condition 9.C.3.(b)(iv) of Part 70/PTO-9788-R2 by operating the high-flow flare for more than three (3) continuous hour periods at a temperature of 50 degrees below the minimum high-flow flare operating temperature of 1,547 F on four (4) days during the reporting period; and, the combustion temperature varying more than +10 percent (1,757F) or -5 percent (1,517F) five (5) days during the reporting period. |
| NOV | 9007 | 12/13/2007 | Failing to comply with Permit Condition 9.C.1.(b)(iv) of Part 70/PTO-9788-R2 by operating wellfield with oxygen level exceeding 5 percent. |
| NOV | 9172 | 05/13/2008 | Failing to comply with Permit Condition 9.C.3.(a), Table 9.3-2 of Part 70/PTO-9788-R2 by exceeding the BACT emission limit for NOx of 35 ppmv, corrected to 3% exhaust oxygen, for the landfill gas flare. |
| NOV | 9177 | 06/30/2008 | Failing to operate the IC engine at loads greater than 90 % of rated generator power rating or at loads greater than 2790 KW, as required by Permit Condition 9.C.2(b)(ii) of Part 70/APCD PTO-9788-R2. |
| NOV | 9178 | 06/30/2008 | Operating the IC engine with an exhaust temperature more than 50 F below the observed average temperature during the most recent source test performance, as limited by Permit Condition 9.C.2(b)(ix). |
| NOV | 9179 | 06/30/2008 | Operating the IC engine with an exhaust temperature that varied greater than +15 percent or -5 percent for a period greater than 60 minutes form the temperature set per the most recent source test, as limited by Permit Condition 9.C.2(b)(x). |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 9180 | 06/30/2008 | Operating the low flow flare below a minimum flare temperature of 1,400 degrees F, hourly averaged, as limited by Permit Condition 9.C.3.(b)(i). |
| NOV | 9181 | 06/30/2008 | Operating the low flow flare for any "three continuous hour periods" at an average combustion temperature more than 50 degrees F below the average temperature established during the most recent compliant source test, as limited by Permit Condition 9.C.3.(b)(iv)(a). |
| NOV | 9182 | 06/30/2008 | Operating the low flow flare with the combustion temperature varying more than +10 percent or -5 percent from the temperature established during the most recent compliant source test for any period greater than 60 minutes, as limited by Permit Condition 9.C.3.(b)(iv)(b). |
| NOV | 9183 | 06/30/2008 | Operating the high flow flare for any "three continuous hour periods" at an average combustion temperature more than 50 degrees F below the average temperature established during the most recent compliant source test, as limited by Permit Condition 9.C.3.(b)(iv)(a). |
| NOV | 9184 | 06/30/2008 | Operating the high flow flare with the combustion temperature varying more than +10 percent or -5 percent from the temperature established during the most recent compliant source test for any period greater than 60 minutes, as limited by Permit Condition 9.C.3.(b)(iv)(b). |
| NOV | 9189 | 10/28/2008 | Exceeding the heat input limit of 32.93 MMBtu/hr to the IC engine as limited by Condition 9.C.2(b)(iv). |
| NOV | 9190 | 10/28/2008 | Exceeding the heat input limit of 8.19 MMBtu/hr to the low flow flare as limited by Condition 9.C.3(b)(vi). |
| NOV | 9291 | 10/28/2008 | Failing to achieve a minimum 4.03 second residence time when operating the flare in low flow mode, as required by Condition 9.C.3(b)(vii). |
| NOV | 9292 | 10/28/2008 | Failing to notify the SBCAPCD within seven days after discovering deviations from the permit, as required by Condtion 9.A.18. |

| VIOLATION TYPE | NUMBER | ISSUE DATE | DESCRIPTION OF VIOLATION |
|---|---|---|---|
| NOV | 9300 | 01/05/2009 | Operating the IC engine at loads less than 2,790 kW based on three hour rolling average, which is prohibited by Condition 9.C.2(b)(ii). |
| NOV | 9301 | 01/05/2009 | Failing to operate the flare with a combustion temperature no more than 10 percent above or 5 percent below the temperature set-point for any period longer than 60 minutes, as required by Permit Condition 9.C.3(b)(iv) of Part 70/APCD PTO-9788-R2. |
| NOV | 9302 | 01/05/2009 | Operating the high-flow flare at temperatures more than 50 degrees F below the average temperature during the most recent source test, as required by Condition C.3(b)(iv). |
| NTC | 9303 | 01/05/2009 | Condition C.2(b)(vi) |
| NTC | 9304 | 01/05/2009 | Condition C.6(c)(vi) |

## 2.0 ENGINEERING ANALYSIS

2.1 Equipment/Processes: Landfill gas (LFG) generated in the landfill by anaerobic biological decomposition is collected using wells and handled using a collection and transport system. Depending on the gas volume generated the gas is transported either to a large bore piston type internal combustion engine that powers an electric generator, or to an enclosed flare, or to both.

2.2 Emission Controls: Use of low emission IC engine consisting of lean-burn combustion, turbocharged and inter-cooled intake air with fuel-to-air ratio and spark/torch ignition controls. IC engine meets established BACT standards for emission controls for LFG-fired IC engines rated greater than 250 horsepower and fired with lean burn technology.

Use of an enclosed flare with high efficiency burner design, adequate combustion zone residence time, air-to-fuel ratio controls, and combustion zone temperature control system. The flare meets established BACT standards for emission controls for LFG-fired enclosed flare rated at and above 24 MMBtu/hr.

2.3 Emission Factors: Emission factors are taken from the current permit to operate. Because the heat content of the gas has increased, the $SO_x$ emission factor is now lower on a lb/MMBtu basis, but the

permitted sulfur content on a ppmv basis was not changed by this permit. Permitted $SO_x$ emissions are unchanged.

2.4 Reasonable Worst Case Emission Scenario: The emission factors for the IC engine are higher than the emission factors for the flare on a lb/MMBtu basis. Therefore the reasonable worst case emission scenario is for the engine to operate at maximum capacity with the flare combusting the remaining gas.

2.5 Emission Calculations: Emission calculations are done in the manner described in PTO 9788 R2. Emissions are calculated in the attached spreadsheets.

2.6 Special Calculations: The maximum heat input to the engine was determined by reviewing records from the first half of 2008. The peak hourly LFG flow rates to the engine and peak hourly power outputs from the generator on multiple days during the period were compared. The heat content of the LFG, as documented in the Compliance Verification Report was used to calculate a Btu/kW-hr factor (see attachment A) . Based on the data a heat input rate of 14000 Btu/kW-hr is conservatively high. Using this factor and a maximum power output of 3200 kW, the maximum heat input to the engine is 44.8 MMBtu/hr.

The minimum residence time for the flare was calculated using the 99 percent destruction efficiency formula from *Air Pollution Control: A Design Approach* (Cooper/Alley). The minimum destruction efficiency required by subpart WWW and the current permit is 98 percent, so 99 percent destruction efficiency calculations result in a conservatively high minimum residence time. The minimum residence time was calculated for a range of compounds and the highest calculated residence time was taken as the limit. Ethane had the highest residence time requirement, so the calculated minimum residence time was based on the calculations for ethane. A minimum residence time was not calculated for methane destruction, since the permit limits are based on non-methane organic compounds.

For a combustion temperature of 1400 degrees (during low flow operation) the calculated minimum residence time was 0.88 seconds. For a combustion temperature of 1500 degrees (high flow operation) the calculated minimum residence time was 0.24 seconds.

2.7 BACT Analyses: BACT is required for CO and $NO_x$ for this project. The engine and flare are already subject to and meet BACT for $NO_x$, therefore further BACT analysis for $NO_x$ is not required. The SCAQMD BACT guidelines for a landfill gas fired IC engine are 2.5 g CO/bhp-hr. The BAAQMD BACT guidelines for a landfill gas fired IC engine are 2.1 g CO/bhp-hr. The permitted emission factor for the engine is 2.1 g CO/bhp-hr, therefore the IC engine meets BACT for CO. Previous source tests have demonstrated compliance with this limit. Ongoing compliance with BACT is verified through the existing IC Engine *Enhanced I&M Plan.*

The SCAQMD and BAAQMD both define BACT for CO for a landfill gas flare as a ground level enclosed flare with at least a 0.6 second retention time at 1400 deg F and automatic combustion air

control. This flare has a residence time of at least 0.97 seconds at 1400 deg F and automatic combustion air controls, therefore the flare meets BACT for CO.

2.8 Enforceable Operational Limits: The permit has specific, enforceable operational limits.

2.9 Monitoring Requirements: Monitoring of the equipment's operational limits are required to ensure that these are enforceable.

2.10 Recordkeeping and Reporting Requirements: The permit requires that the data which is monitored be recorded and reported to the APCD.

## 3.0 REGULATORY REVIEW

3.1 List of Applicable Rules for this ATC/PTO only: This ATC/PTO specifically requires compliance with the following rules:

| | |
|---|---|
| Rule 201. | Permits Required |
| Rule 202. | Exemptions to Rule 201 |
| Rule 301. | Circumvention |
| Rule 302. | Visible Emissions |
| Rule 303. | Nuisance |
| Rule 305 | Particulate Matter, Southern Zone |
| Rule 309 | Specific Contaminants |
| Rule 311. | Sulfur Content of Fuels |
| Rule 505 | Breakdown Conditions |
| Rule 802. | Nonattainment Review |
| Rule 803. | Prevention of Significant Deterioration |
| Regulation X | New Source Performance Standards (includes Subpart WWW of Part 60) |
| Regulation XI | NESHAP (MACT – includes Subpart AAAA) |
| Regulation XIII. | Part 70 Operating Permit Program |

3.2 Rules Requiring Review:

*Rule 311 - Sulfur Content of Fuels*: This rule limits the sulfur content of fuels combusted at the Tajiguas Landfill facility to 0.5 percent (by weight) for liquids fuels and 15 gr/100 scf (calculated as $H_2S$) {or 239 ppmvd} for gaseous fuels. The LFG total sulfur content may not exceed 100 ppmv (measured as $H_2S$). Compliance with this requirement is determined by sampling the LFG.

*Rule 803 – Prevention of Significant Deterioration:* This rule provides for the review of new and modified sources in areas designated attainment. Santa Barbara County is designated attainment for the 8 hour and 1 hour California and National Standards for CO. BACT and an Air Quality Impact Analysis (AQIA) is required for any net emissions increase of 550 lb CO/day or more and 120 lb $NO_x$/day or more. The NEI is greater than 550 lb CO/day and 120 lb $NO_x$/day, therefore BACT and an AQIA are required for CO and $NO_x$.

3.3 NEI Calculations: The net emission increase calculation is used to determine whether certain requirements must be applied to a project (e.g., offsets, AQIA, PSD BACT). This permit contributes to NEI. The NEI values for the stationary source are equal to the potential to emit of the flare and generator IC engine combined.

## 4.0 AQIA

An Air Quality Impact Analysis for $NO_x$ and CO emissions was required for this project. An initial screening was conducted using the Valley method in SCREEN3. For this initial screening the worst case location was found to be 259 meters from the stacks. The maximum 1 hour concentration of CO was calculated as 551 micrograms per cubic meter. The maximum 8 hour average concentration of CO was calculated as 386 micrograms per cubic meter. Background 1 hour concentrations were 5,196 micrograms CO per cubic meter. The sum of modeled concentrations plus background concentrations is 5,465 micrograms CO per cubic meter. The total modeled concentration is less than the 1-hour maximum allowable increase of 10,000 micrograms per cubic meter and the 1-hour air quality standard of 40,000 micrograms per cubic meter. Similarly the total modeled concentration is less than the 8-hour maximum allowable increase of 2,500 micrograms per cubic meter and the 8-hour air quality standard of 10,000 micrograms per cubic meter. Based on the results of this screening it is clear that the source will not cause or contribute to a violation of an air quality standard or consume the maximum allowable increment increase, therefore further modeling is not required for CO.

The maximum 1 hour concentration of $NO_x$ was calculated as 139 micrograms per cubic meter. The maximum annual concentration of $NO_x$ was calculated as 14 micrograms per cubic meter. Background 1 hour concentrations were 67 micrograms $NO_2$ per cubic meter. The sum of modeled concentrations plus background concentrations is 206 micrograms $NO_x$ per cubic meter. The total modeled concentration is less than the 1-hour air quality standard of 470 micrograms per cubic meter. The total modeled concentration is less than the annual maximum allowable increase of 25 micrograms per cubic meter and the annual air quality standard of 100 micrograms per cubic meter. Because the 1 hour $NO_x$ concentration is over the lower level of the increment range, the increment due to this project must be compared to the increment range; This project represents a 28% increase in the combined potential to emit of the flare and engine, therefore the increment due to this project is 139 x 0.28 = 39 micrograms per cubic meter, which is less than the lower level of the 1-hour maximum allowable increase of 100 micrograms per cubic meter. Based on the results of this screening it is clear that the source will not cause or contribute to a violation of an air quality standard or consume the maximum allowable increment increase, therefore further modeling is not required.

The mass emissions inputs for the model were based on the CO PTE of the flare and the IC engine calculated for this ATC/PTO for two different scenarios. The first scenario was based on a heat input of 78.0 MMBtu/hr for the flare combusting the total amount of LFG by itself. The second scenario was based on a heat input of 44.8 MMBtu/hr for the IC engine and 33.2 MMBtu/hr for the flare when the engine is operating at full load and the flare is combusting the remaining LFG. The scenario which resulted in the worst-case concentrations was the scenario with the IC engine operating, so it was the one this analysis is based on.

The complex terrain option was selected for the model. The terrain points used in the 11/21/01 modeling conducted for ATC Mod 9788 04 were used. These individual terrain points were converted to distances from the stack and height above the stack to generate a two dimensional terrain profile. The profile used the highest elevations at each distance, for example, if a point 500 meters to the south was 10 meters higher than the base of the stack and a point 500 meters to the northwest was 100 meters higher than the base of the stack, the height entered into the model at 500 meters would be 100 meters. Essentially the modeling was conducted as if the stacks were in a conical valley, this results in a conservatively high calculated concentration.

For model inputs the stack height, diameter, and flow rate for both the flare and IC engine were taken from the source test report for testing conducted 4/22/08 and 4/23/08. For the IC engine stack velocity was measured during the source test and the average stack velocity during the source test was used as an input for the model. Since the heat input to the engine during the source test was lower than the maximum heat input permitted by this ATC/PTO the stack gas velocity recorded during the source test is lower than the maximum stack gas velocity expected from the IC engine at full load. This will tend to bias the results high close to the engine and bias the results low far from the engine. The stack gas flow rate was not determined for the flare during the source test. The stack flow rate used as a model input was calculated as follows:

1. From the LFG gas composition of 0.33 vol% $0_2$, 3.64 vol% $N_2$, 34.49 vol% $CO_2$, and 61.53 vol% CH4 it was assumed that only CH4 was combusted and the other LFG constituents did not react. Since the oxygen and nitrogen content of the LFG is low, this assumption should not greatly affect the calculated flow rate.
2. For 1 scfm of $CH_4$ combusted there are 10.52 scfm of exhaust gas (assuming complete combustion and counting water vapor).
3. For 2000 scfm of LFG in there is (0.0033 + 0.0364 + 0.3449 + (0.6153*10.52))*2000 = 13,715 scfm exhaust gas out.
4. Correcting to actual exhaust temperature 13,715 scfm * (460 + 1550 deg F)/(520 deg R) = 53,014 acfm exhaust at 1550 deg F.

The flare was modeled as a point source because it is an enclosed ground level flare. Fumigation concentrations were estimated using a model input of 2500 feet from the shoreline. The model was run once for the flare and once for the IC engine. The outputs of each run were added together and the worst case location was determined.

Screen 3 calculates a 1 hour average internally and then outputs a 24 hour average by multiplying the results of the internal calculation by 0.25. Therefore the model outputs were divided by 0.25 to convert the 24 hour outputs back to 1 hour concentrations. The 1 hour concentrations were converted to 8 hour averaged concentrations using a conversion factor of 0.7. The 1 hour concentrations were multiplied by 0.1 to determine the annual average concentration. These conversions are based on the District's "Modeling Guidelines for Air Quality Impact Analysis".

The 1 hour CO concentration calculated by the model was divided by the CO emission rate in lb/hr and multiplied by the $NO_x$ emission rate in lb/hr to determine the maximum $NO_x$ concentration in lb/hr. The ozone limiting method was not used to convert $NO_x$ concentrations to $NO_2$. This means the calculated $NO_x$ concentrations likely overstate $NO_2$ concentrations at the site.

For background concentrations, the 2005, 2006, 2007 Annual Air Quality Reports were reviewed. For $NO_2$ the El Capitan station was used and the fourth highest concentration from the three years taken as the background concentration. For CO the Lompoc station was used and the highest concentration from the three years was taken as the background concentration.

## 5.0 OFFSETS/ERCs

The emission offset thresholds of Regulation VIII are not exceeded.

## 6.0 AIR TOXICS

An air toxics health risk assessment was not performed for this permitting action.

## 7.0 CEQA / LEAD AGENCY

The APCD is the lead agency for this project. The modification authorized under this permit is exempt from the California Environmental Quality Act ("CEQA"). The exemption is authorized per CEQA Section 15061(b)(3) (*General Exemption*), since any impact caused by the project is well below the thresholds specified for any significant adverse impact.

## 8.0 PUBLIC and AGENCY NOTFICATION PROCESS

This project is not subject to public notice.

## 9.0 COMMENTS ON DRAFT PERMIT

The permittees had the following comments on the draft permit:

1. MM Tajiguas made comments related to the minimum load, NMOC control efficiency, cold start, and monitoring requirements for the IC engine, and the condensate injection rate requirement for the flare. These issues will be addressed as part of the reevaluation of PTO 9788-R2, which is currently underway. These issues won't be addressed as part of this ATC-PTO, which is solely for the heat input increase and minimum residence time decrease.
2. MM Tajiguas requested the heat input limit for the IC engine and the flare be allowed to vary based on the heat content of the LFG. The heat input limit is based on the maximum expected heat input to the engine in this application and must be stated on the permit as a constant number.
3. MM Tajiguas requested the minimum residence time requirement be relaxed. The minimum residence time requirement on the permit must be set at a limit expected to ensure compliance with permit conditions. The minimum residence time was calculated using an equation for the time necessary to achieve 99% control, and an additional 10% was added to the calculated time for a margin of error. Since the required destruction efficiency is 98%, the 99% control

calculation inherently has a margin of error, so the addition 10% will be removed. Without an analysis indicating the required destruction efficiency will be attained at the proposed residence time, it will not be lowered further.

4. MM Tajiguas wished to note in Section 1.2 that the ownership of the facility has not changed. To clarify, MM Tajiguas LLC continues to own and operate the IC engine generator and NEO Tajiguas LLC continues to own and operate the LFG collection system. Fortistar Methane Group LLC purchased MM Tajiguas LLC and NEO Tajiguas LLC from Algonquin Power Systems LFG, LLC.
5. MM Tajiguas questioned the basis for the $PM_{10}$ emission limit for the IC engine. The $PM_{10}$ limit was established by ATC 9788; it cannot be modified without a demonstration by MM Tajiguas that there was an error in the original evaluation.

## 10.0 FEE DETERMINATION

Fees for the APCD's work efforts are assessed on a fee/cost reimbursement basis. The Project Code is 205383 (*Tajiguas Landfill*).

## 11.0 RECOMMENDATION

It is recommended that this permit be granted with the conditions as specified in the permit.

| | | | |
|---|---|---|---|
| AQ Engineer | 7/7/9 Date | Engineering Supervisor | 7/7/09 Date |

ATTACHMENTS

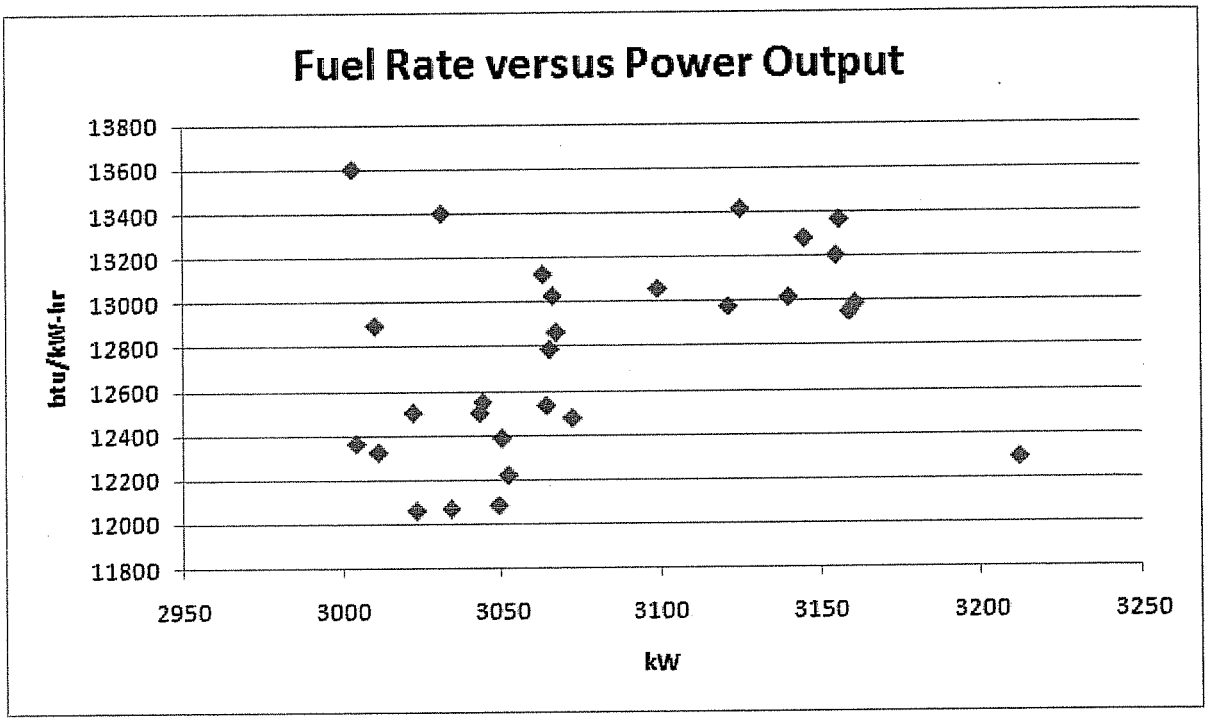
A Background Calculations
B Emissions Tables
C Screening results

# ATTACHMENT A

## Background Calculations

## Heat Input and Power Output

| | LFG Consumed/hr | kW | btu/scf | btu/kw-hr |
|---|---|---|---|---|
| Jan | 1247 | 2990 | 535 | 13387.52508 |
| | 1272 | 3003 | 535 | 13596.8032 |
| | 1265 | 3031 | 535 | 13397.06368 |
| | 1209 | 3010 | 535 | 12893.32226 |
| | 1211 | 2897 | 535 | 13418.39834 |
| | 1190 | 3044 | 535 | 12548.94875 |
| | 1177 | 3050 | 535 | 12387.44262 |
| | 1141 | 3034 | 535 | 12071.8853 |
| feb | 1148 | 3049 | 535 | 12086.19219 |
| | 1157 | 2711 | 535 | 13699.63113 |
| | 1162 | 3052 | 535 | 12221.55963 |
| | 1156 | 3011 | 535 | 12324.01196 |
| | 1138 | 2625 | 535 | 13916.11429 |
| | 1141 | 2940 | 535 | 12457.85714 |
| | 1169 | 2822 | 535 | 13297.27144 |
| | 1136 | 3023 | 535 | 12062.71915 |
| | 1177 | 3022 | 535 | 12502.21707 |
| march | 1185 | 3043 | 535 | 12500.32862 |
| | 1157 | 3004 | 535 | 12363.41545 |
| | 1188 | 2732 | 535 | 13958.56515 |
| | 1047 | 2779 | 535 | 12093.81072 |
| april | 1077 | 3063 | 622 | 13122.31146 |
| | 1070 | 3066 | 622 | 13024.26614 |
| | 1097 | 2987 | 622 | 13706.07298 |
| | 1057 | 3067 | 622 | 12861.83241 |
| | 1027 | 3072 | 622 | 12476.44531 |
| may | 1029 | 3064 | 622 | 12533.3812 |
| | 1050 | 3065 | 622 | 12784.99184 |
| | 1085 | 3121 | 622 | 12974.11086 |
| | 1096 | 3159 | 622 | 12947.9962 |
| | 1100 | 3161 | 622 | 12987.02942 |
| | 1095 | 3140 | 622 | 13014.4586 |
| | 1130 | 3156 | 622 | 13362.35741 |
| | 1119 | 3145 | 622 | 13278.5628 |
| june | 1116 | 3155 | 622 | 13200.98891 |
| | 1123 | 3125 | 622 | 13411.3152 |
| | 1084 | 3099 | 622 | 13054.17231 |
| | 1077 | 2591 | 622 | 15512.79043 |
| | 1079 | 3560 | 622 | 11311.31461 |
| | 1032 | 3323 | 622 | 11590.20163 |
| | 1058 | 3212 | 622 | 12292.8269 |


Fuel Rate versus Power Output
btu/kW-hr
13800
13600
13400
13200
13000
12800
12600
12400
12200
12000
11800
2950
3000
3050
3100
3150
3200
3250
kW

**Ethane**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{99} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable Value | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1400 | |
| W1 | # of C atoms | 2 | |
| W2 | Aromatic (0=no;1=yes) | 0 | |
| W3 | C= Bond (0=no;1=yes) | 0 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 986 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 3 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Results | | |
| | Residence time | 0.881436457 | |

**Ethane**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{99} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable Value | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1500 | |
| W1 | # of C atoms | 2 | |
| W2 | Aromatic (0=no;1=yes) | 0 | |
| W3 | C= Bond (0=no;1=yes) | 0 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 986 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 3 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Results | | |
| | Residence time | 0.236865499 | |

**Propane**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{99} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V. | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1400 | |
| W1 | # of C atoms | 3 | |
| W2 | Aromatic (0=no;1=yes) | 0 | |
| W3 | C= Bond (0=no;1=yes) | 0 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 871 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 2.666667 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.219512 | |

**Propane**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{99} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V. | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1500 | |
| W1 | # of C atoms | 3 | |
| W2 | Aromatic (0=no;1=yes) | 0 | |
| W3 | C= Bond (0=no;1=yes) | 0 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 871 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 2.666667 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.058989 | |

**Butane**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{pp} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V. | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1400 | |
| W1 | # of C atoms | 4 | |
| W2 | Aromatic (0=no;1=yes) | 0 | |
| W3 | C= Bond (0=no;1=yes) | 0 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 896 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 2.5 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.193624 | |

**Butane**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{pp} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V. | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1500 | |
| W1 | # of C atoms | 4 | |
| W2 | Aromatic (0=no;1=yes) | 0 | |
| W3 | C= Bond (0=no;1=yes) | 0 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 896 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 2.5 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.052032 | |

**Ethylbenzene**
Reference: Air Pollution Control: A Design Approach, Cooper/Alley
Eq. 11.14

$T_{pp} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1400 | |
| W1 | # of C atoms | 8 | |
| W2 | Aromatic (0=no;1=yes) | 1 | |
| W3 | C= Bond (0=no;1=yes) | 1 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 870 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 1.25 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.237564 | |

**Ethylbenzene**
Reference: Air Pollution Control: A Design Approach, Cooper/Alley
Eq. 11.14

$T_{pp} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1500 | |
| W1 | # of C atoms | 8 | |
| W2 | Aromatic (0=no;1=yes) | 1 | |
| W3 | C= Bond (0=no;1=yes) | 1 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 870 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 1.25 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.06384 | |

**Xylene**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{pp} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V. | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1400 | |
| W1 | # of C atoms | 8 | |
| W2 | Aromatic (0=no;1=yes) | 1 | |
| W3 | C= Bond (0=no;1=yes) | 1 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 924 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 1.25 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.360055 | |

**Xylene**

Reference: Air Pollution Control: A Design Approach, Cooper/Alley

Eq. 11.14

$T_{pp} = 577 - 10W1 + 110.2W2 + 67.1W3 + 72.6W4 + 0.586W5 - 23.4W6 - 430.9W7 + 85.2W8 - 82.2W9 + 65.5W10 - 76.1W11$

| Variable | Description | Variable V. | Reference |
|---|---|---|---|
| T99 (oF) | Combustion Temp | 1500 | |
| W1 | # of C atoms | 8 | |
| W2 | Aromatic (0=no;1=yes) | 1 | |
| W3 | C= Bond (0=no;1=yes) | 1 | |
| W4 | # of N atoms | 0 | |
| W5 | autoignition temp, oF | 924 | Cooper - Alley Table 11.1 |
| W6 | # of O atoms | 0 | |
| W7 | # of sulfur atoms | 0 | |
| W8 | H/C atom ratio | 1.25 | |
| W9 | allyl cmpd. (0=no;1=yes) | 0 | |
| W10 | C=&CL interaction (0=no;1=yes) | 0 | |
| | Residence Time (sec.) | 2 | |
| | Results | | |
| | Residence time | 0.096756 | |

# ATTACHMENT B

## Emissions Tables

**Table 5.1**
**Tajigmas Landfill ATC-PTO 13002**
**Combustion Equipment Operating Description**

| Item | Make/Model | SERNO Or Tag # | Used As | Equipment Specifications | | | | Operating Limitations | | | | | | Fuel Properties[2] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Max. Output | | Emission | BSFC | On-line Time | | | Heat Input (MMBTU) | | | HHV | Tot. Sulfur |
| | | | | Data | Units | Controls: | Btu/hp-hr | (hr/day) | (hr/qtr) | (hr/yr) | (per hr) | (per qtr) | (per yr) | Btu/SCF | (ppmv) |
| 1 | Caterpillar /G3616 | 4CG00110 | AC Elec. Gen. | 4231 | BHP [1] | Lean-burn | 7783 | 24 | 2190 | 8760 | 44.80 | 98112 | 392448 | 650 | 100 |
| 2 | LFG Specialties / ERA 84018 | 1519-M2 | Flare | 2000 | scfm | Burner/Temp | N/A | 24 | 2190 | 8760 | 78.00 | 170820 | 683280 | 650 | 100 |
| 3 | John Deere | 4039DF001 | Water Pump | 71.0 | BHP | DPF | 7,700 | 24 | 520 | 2080 | 0.55 | 284 | 1137 | 19433 | 0.0015 |

Notes:
(1) The stated IC engine BHP in this table is the maximum permitted output of the engine in this service. The actual maximum manufacturer rating for this unit is 4314 BHP.
(2) HHV for the John Deere Diesel Engine is given as Btu/lb and total sulfur is given as % by weight.

**Table 5.2**
**Tajiguas Landfill ATC-PTO 13002**
**Combustion Equipment Emission Factors**

| Item #/Equipment | Specification | NOx | ROC/NMOC | CO | SOx | PM | PM10 | References |
|---|---|---|---|---|---|---|---|---|
| #1 | g/bhp-hr | 0.53 | 0.216 | 2.10 | n/a | 0.066 | 0.066 | EF at ATC/PTO 9788 levels per correspondence dated 11/14/00 except CO |
| Caterpillar IC Engine | lb/MMBtu | 0.150 | 0.061 | 0.594 | 0.026 | 0.019 | 0.019 | lb/MMBTU calculated from gm/bhp-hr EF |
| | ppmvd @ 3% | 113 | 20 | 734.1 | n/a | n/a | n/a | Calculated using $K_{LFGlb}$ Factor (except for ROC) |
| #2 | g/bhp-hr | n/a | n/a | n/a | n/a | n/a | n/a | |
| Flare | lb/MMBtu | 0.048 | 0.038 | 0.150 | 0.026 | 0.008 | 0.008 | Flare em. facs. per ATC/PTO 9788 application except CO |
| | ppmvd @ 3% | 36 | 15 | 185 | n/a | n/a | n/a | Calculated using $K_{LFGlb}$ Factor (except for ROC) |
| #3 | g/bhp-hr | 9.200 | 1.120 | 3.030 | 0.006 | 0.060 | 0.060 | NOx per Deere. PM per engine test /DPF |
| John Deere IC Engine | lb/MMBtu | 2.634 | 0.321 | 0.868 | 0.00154 | 0.017 | 0.017 | |

**Table 5.3**
**Tajiguas Landfill ATC-PTO 13002**
**Combustion Equipment Emission Limits**

## Hourly and Daily Emission Limitations

| Operating Mode[1] | NOx | | ROC [2] | | CO | | SOx | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day |
| 1 - IC Engine | 6.72 | 161.28 | 2.74 | 65.73 | 26.63 | 639.05 | 1.16 | 27.96 | 0.84 | 20.08 | 0.84 | 20.08 |
| 2 - Flare | 3.74 | 89.86 | 2.96 | 71.14 | 11.70 | 280.80 | 2.03 | 48.67 | 0.62 | 14.98 | 0.62 | 14.98 |
| Combined Flare and Engine | 8.31 | 199.53 | 4.00 | 96.01 | 31.61 | 758.57 | 2.03 | 48.67 | 1.10 | 26.46 | 1.10 | 26.46 |
| 3 - Diesel IC Engine | 1.44 | 34.56 | 0.18 | 4.21 | 0.47 | 11.39 | 0.00 | 0.02 | 0.01 | 0.22 | 0.01 | 0.22 |
| **Maximum Project Limits** | **9.75** | **234.09** | **4.18** | **100.22** | **32.08** | **769.96** | **2.03** | **48.69** | **1.11** | **26.68** | **1.11** | **26.68** |

Notes:
(1) Keyed to the Equipment List in Table 5.1.
(2) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(3) Exhaust ROC for all emission units in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

## Quarterly and Annual Emission Limitations

| Operating Mode[1] | NOx | | ROC [2] | | CO | | SOx | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY |
| 1 - IC Engine | 7.36 | 29.43 | 3.00 | 12.00 | 29.16 | 116.63 | 1.28 | 5.10 | 0.92 | 3.67 | 0.92 | 3.67 |
| 2 - Flare | 4.10 | 16.40 | 3.25 | 12.98 | 12.81 | 51.25 | 2.22 | 8.88 | 0.68 | 2.73 | 0.68 | 2.73 |
| Combined Flare and Engine | 9.10 | 36.41 | 4.38 | 17.52 | 34.61 | 138.44 | 2.22 | 8.88 | 1.21 | 4.83 | 1.21 | 4.83 |
| 3 - Diesel IC Engine | 0.37 | 1.50 | 0.05 | 0.18 | 0.12 | 0.49 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| **Maximum Project Limits** | **9.48** | **37.91** | **4.43** | **17.70** | **34.73** | **138.93** | **2.22** | **8.88** | **1.21** | **4.84** | **1.21** | **4.84** |

Notes:
(1) Keyed to the Equipment List in Table 5.1.
(2) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(3) Exhaust ROC for all emission units in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

**Table 5.7**
**Tajiguas Landfill ATC-PTO 13002**
**Total Permitted Emissions**

## Hourly and Daily Entire Source Emission Limitations

| Operating Mode | $NO_x$ (1) | | ROC (2) | | CO | | $SO_x$ (1) | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day |
| 1 - Combustion Equipment | 9.75 | 234.09 | 4.18 | 100.22 | 32.08 | 769.96 | 2.03 | 48.69 | 1.11 | 26.68 | 1.11 | 26.68 |
| 3 - Fugitive Landfill Gas Emissions | 0.00 | 0.00 | 6.62 | 158.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Permitted Emissions** | **9.75** | **234.09** | **10.80** | **259.10** | **32.08** | **769.96** | **2.03** | **48.69** | **1.11** | **26.68** | **1.11** | **26.68** |

Notes:
(1) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(2) Exhaust ROC for all emission units (except landfill organic fugitives) in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

## Quarterly and Annual Emission Limitations

| Operating Mode | $NO_x$ (1) | | ROC (2) | | CO | | $SO_x$ (1) | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY |
| 1 - Combustion Equipment | 9.48 | 37.91 | 4.43 | 17.70 | 34.73 | 138.93 | 2.22 | 8.88 | 1.21 | 4.84 | 1.21 | 4.84 |
| 3 - Fugitive Landfill Gas Emissions | 0.00 | 0.00 | 7.25 | 28.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Permitted Emissions** | **9.48** | **37.91** | **11.67** | **46.70** | **34.73** | **138.93** | **2.22** | **8.88** | **1.21** | **4.84** | **1.21** | **4.84** |

Notes:
(1) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(2) Exhaust ROC for all emission units (except landfill organic fugitives) in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

**Table 5.8**
**Tajiguas Landfill ATC-PTO 13002**
**Federal Potential to Emit**

## Hourly and Daily Entire Source Emissions

| Operating Mode | NOx[1] | | ROC[2] | | CO | | SOx[1] | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day |
| 1 - Combustion Equipment | 9.75 | 234.09 | 4.18 | 100.22 | 32.08 | 769.96 | 2.03 | 48.69 | 1.11 | 26.68 | 1.11 | 26.68 |
| 2 - Earthmoving Fugitive Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 - Fugitive Landfill Gas Emissions | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 - Onsite Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Federal PTE** | **9.75** | **234.09** | **4.18** | **100.22** | **32.08** | **769.96** | **2.03** | **48.69** | **1.11** | **26.68** | **1.11** | **26.68** |

Notes:
(1) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(2) Exhaust ROC for all emission units (except landfill organic fugitives) in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

## Quarterly and Annual Emissions

| Operating Mode | NOx[1] | | ROC[2] | | CO | | SOx[1] | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY |
| 1 - Combustion Equipment | 9.48 | 37.91 | 4.43 | 17.70 | 34.73 | 138.93 | 2.22 | 8.88 | 1.21 | 4.84 | 1.21 | 4.84 |
| 2 - Earthmoving Fugitive Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 - Fugitive Landfill Gas Emissions | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 - Onsite Vehicles | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Federal PTE** | **9.48** | **37.91** | **4.43** | **17.70** | **34.73** | **138.93** | **2.22** | **8.88** | **1.21** | **4.84** | **1.21** | **4.84** |

Notes:

**Table 5.9**
**Tajiguas Landfill PTO 9788**
**Facility Potential to Emit**

## Hourly and Daily Entire Source Emission Limitations

| Operating Mode | NOx[1] | | ROC[2] | | CO | | SOx[1] | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day | lb/hr | lb/day |
| 1 - Combustion Equipment | 9.75 | 234.09 | 4.18 | 100.22 | 32.08 | 769.96 | 2.03 | 48.69 | 1.11 | 26.68 | 1.11 | 26.68 |
| 2 - Earthmoving Fugitive Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.47 | 283.75 | 12.77 | 102.15 |
| 3 - Blasting Fugitive Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.56 | 20.48 | 0.56 | 4.51 |
| 3 - Fugitive Landfill Gas Emissions | 0.00 | 0.00 | 6.62 | 158.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 - Onsite Vehicles | 37.18 | 297.40 | 2.70 | 21.60 | 14.44 | 115.50 | 0.89 | 7.10 | 1.00 | 8.00 | 1.00 | 8.00 |
| **Total FPTE** | **46.93** | **531.49** | **13.50** | **280.70** | **46.52** | **885.46** | **2.92** | **55.79** | **40.14** | **338.91** | **15.44** | **141.34** |

Notes:
(1) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(2) Exhaust ROC for all emission units (except landfill organic fugitives) in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

## Quarterly and Annual Emission Limitations

| Operating Mode | NOx[1] | | ROC[2] | | CO | | SOx[1] | | PM | | PM10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY | TPQ | TPY |
| 1 - Combustion Equipment | 9.48 | 37.91 | 4.43 | 17.70 | 34.73 | 138.93 | 2.22 | 8.88 | 1.21 | 4.84 | 1.21 | 4.84 |
| 2 - Earthmoving Fugitive Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.89 | 43.56 | 3.92 | 15.68 |
| 3 - Blasting Fugitive Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.00 | 0.01 |
| 3 - Fugitive Landfill Gas Emissions | 0.00 | 0.00 | 7.25 | 28.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 - Onsite Vehicles | 11.41 | 45.65 | 0.83 | 3.32 | 4.43 | 17.73 | 0.27 | 1.09 | 0.31 | 1.23 | 0.31 | 1.23 |
| **Total FPTE** | **20.89** | **83.56** | **12.50** | **50.01** | **39.17** | **156.66** | **2.49** | **9.97** | **12.41** | **49.65** | **5.44** | **21.76** |

Notes:
(1) Mass emissions for NOx as $NO_2$; SOx as $SO_2$
(2) Exhaust ROC for all emission units (except landfill organic fugitives) in this permit is also equivalent to the Non-methane Organic Compound ("NMOC") mass limit.

# ATTACHMENT C

## Screening Results

05/06/09
08:52:57

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Tajiguas Flare low

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = POINT
EMISSION RATE (G/S) = 0.627500
STACK HEIGHT (M) = 13.7160
STK INSIDE DIAM (M) = 2.4384
STK EXIT VELOCITY (M/S)= 5.3645
STK GAS EXIT TEMP (K) = 1116.4833
AMBIENT AIR TEMP (K) = 293.1500
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = 0.0000
MIN HORIZ BLDG DIM (M) = 0.0000
MAX HORIZ BLDG DIM (M) = 0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 57.664 M**4/S**3; MOM. FLUX = 11.232 M**4/S**2.

*** FULL METEOROLOGY ***

**********
*** SCREEN AUTOMATED DISTANCES ***
**********

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

| DIST (M) | CONC (UG/M**3) | STAB | U10M (M/S) | USTK (M/S) | MIX HT (M) | PLUME HT (M) | SIGMA Y (M) | SIGMA Z (M) | DWASH |
|---|---|---|---|---|---|---|---|---|---|
| 1. | 0.000 | 1 | 1.0 | 1.0 | 446.0 | 444.99 | 1.78 | 1.74 | NO |
| 100. | 0.8375E-01 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 32.21 | 31.82 | NO |
| 200. | 0.4069 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 15.83 | 8.97 | NO |
| 300. | 2.531 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 22.92 | 12.67 | NO |
| 400. | 3.975 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 29.81 | 15.94 | NO |
| 500. | 4.409 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 36.53 | 19.05 | NO |
| 600. | 4.298 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 43.14 | 22.04 | NO |
| 700. | 3.971 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 49.55 | 24.77 | NO |
| 800. | 3.597 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 55.90 | 27.45 | NO |
| 900. | 3.314 | 4 | 15.0 | 15.7 | 4800.0 | 36.10 | 62.40 | 30.53 | NO |
| 1000. | 3.086 | 4 | 15.0 | 15.7 | 4800.0 | 36.10 | 68.60 | 33.08 | NO |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1100. | 2.852 | 4 | 15.0 | 15.7 | 4800.0 | 36.10 | 74.74 | 35.05 | NO |
| 1200. | 2.638 | 4 | 15.0 | 15.7 | 4800.0 | 36.10 | 80.84 | 36.97 | NO |
| 1300. | 2.443 | 4 | 15.0 | 15.7 | 4800.0 | 36.10 | 86.89 | 38.84 | NO |
| 1400. | 2.319 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 93.33 | 41.63 | NO |
| 1500. | 2.219 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 99.27 | 43.37 | NO |
| 1600. | 2.121 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 105.18 | 45.07 | NO |
| 1700. | 2.026 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 111.06 | 46.74 | NO |
| 1800. | 1.935 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 116.90 | 48.38 | NO |
| 1900. | 1.847 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 122.72 | 49.99 | NO |
| 2000. | 1.765 | 4 | 10.0 | 10.5 | 3200.0 | 50.95 | 128.51 | 51.57 | NO |
| 2100. | 1.691 | 4 | 8.0 | 8.4 | 2560.0 | 62.08 | 134.57 | 53.89 | NO |
| 2200. | 1.635 | 4 | 8.0 | 8.4 | 2560.0 | 62.08 | 140.29 | 55.40 | NO |
| 2300. | 1.581 | 4 | 8.0 | 8.4 | 2560.0 | 62.08 | 145.99 | 56.89 | NO |
| 2400. | 1.528 | 4 | 8.0 | 8.4 | 2560.0 | 62.08 | 151.66 | 58.37 | NO |
| 2500. | 1.477 | 4 | 8.0 | 8.4 | 2560.0 | 62.08 | 157.31 | 59.82 | NO |
| 2600. | 1.440 | 5 | 4.5 | 5.0 | 10000.0 | 78.65 | 122.87 | 43.37 | NO |
| 2700. | 1.448 | 5 | 4.5 | 5.0 | 10000.0 | 78.65 | 127.04 | 44.13 | NO |
| 2800. | 1.472 | 5 | 2.0 | 2.2 | 10000.0 | 101.57 | 132.19 | 47.72 | NO |
| 2900. | 1.501 | 5 | 2.0 | 2.2 | 10000.0 | 101.57 | 136.30 | 48.43 | NO |
| 3000. | 1.530 | 5 | 1.5 | 1.7 | 10000.0 | 110.41 | 140.87 | 50.46 | NO |
| 3500. | 1.669 | 5 | 1.5 | 1.7 | 10000.0 | 110.41 | 161.14 | 53.75 | NO |
| 4000. | 1.801 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 181.83 | 58.97 | NO |
| 4500. | 1.870 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 201.58 | 61.56 | NO |
| 5000. | 1.915 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 221.13 | 64.06 | NO |
| 5500. | 1.940 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 240.51 | 66.46 | NO |
| 6000. | 1.950 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 259.70 | 68.79 | NO |
| 6500. | 1.949 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 278.74 | 71.03 | NO |
| 7000. | 1.937 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 297.62 | 73.21 | NO |
| 7500. | 1.919 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 316.36 | 75.33 | NO |
| 8000. | 1.895 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 334.96 | 77.40 | NO |
| 8500. | 1.867 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 353.44 | 79.41 | NO |
| 9000. | 1.837 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 371.79 | 81.37 | NO |
| 9500. | 1.804 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 390.03 | 83.29 | NO |
| 10000. | 1.770 | 5 | 1.0 | 1.1 | 10000.0 | 124.41 | 408.15 | 85.16 | NO |
| 15000. | 1.648 | 6 | 1.0 | 1.2 | 10000.0 | 103.66 | 389.28 | 60.60 | NO |
| 20000. | 1.462 | 6 | 1.0 | 1.2 | 10000.0 | 103.66 | 501.61 | 65.54 | NO |
| 25000. | 1.307 | 6 | 1.0 | 1.2 | 10000.0 | 103.66 | 610.29 | 69.76 | NO |
| 30000. | 1.180 | 6 | 1.0 | 1.2 | 10000.0 | 103.66 | 716.05 | 73.48 | NO |
| 40000. | 0.9742 | 6 | 1.0 | 1.2 | 10000.0 | 103.66 | 920.58 | 78.80 | NO |
| 50000. | 0.8311 | 6 | 1.0 | 1.2 | 10000.0 | 103.66 | 1117.72 | 83.26 | NO |

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 518. | 4.416 | 4 | 20.0 | 21.0 | 6400.0 | 28.67 | 37.80 | 19.63 | NO |

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** INVERSION BREAK-UP FUMIGATION CALC. ***
CONC (UG/M**3) = 3.895
DIST TO MAX (M) = 4998.12

***
PLUME HEIGHT IS BELOW TIBL HEIGHT
FOR DISTANCE TO SHORELINE OF 762.00 M.
NO SHORELINE FUMIGATION CALCULATION MADE.
***

**********
*** SUMMARY OF SCREEN MODEL RESULTS ***
**********

| CALCULATION PROCEDURE | MAX CONC (UG/M**3) | DIST TO MAX (M) | TERRAIN HT (M) |
|---|---|---|---|
| SIMPLE TERRAIN | 4.416 | 518. | 0. |
| INV BREAKUP FUMI | 3.895 | 4998. | -- |

03/05/09
09:01:53

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Tajiguas ICE

COMPLEX TERRAIN INPUTS:
SOURCE TYPE = POINT
EMISSION RATE (G/S) = 3.35540
STACK HT (M) = 13.7160
STACK DIAMETER (M) = 0.6604
STACK VELOCITY (M/S) = 41.9082
STACK GAS TEMP (K) = 739.8167
AMBIENT AIR TEMP (K) = 293.1500
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 27.053 M**4/S**3; MOM. FLUX = 75.878 M**4/S**2.

FINAL STABLE PLUME HEIGHT (M) = 68.3
DISTANCE TO FINAL RISE (M) = 151.4

| | | *VALLEY 24-HR CALCS* | | **SIMPLE TERRAIN 24-HR CALCS** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TERR HT (M) | MAX 24-HR DIST (M) | MAX 24-HR CONC (UG/M**3) | PLUME HT CONC (UG/M**3) | PLUME HT ABOVE STK BASE (M) | PLUME HT CONC (UG/M**3) | PLUME HT ABOVE STK HGT (M) | SC | U10M (M/S) | USTK |
| 31. | 96. | 88.54 | 88.54 | 54.0 | 19.33 | 12.1 | 4 | 20.0 | 21.0 |
| 42. | 148. | 78.60 | 78.60 | 67.5 | 51.19 | 12.1 | 4 | 20.0 | 21.0 |
| 49. | 194. | 106.6 | 106.6 | 68.3 | 57.15 | 12.1 | 4 | 20.0 | 21.0 |
| 71. | 259. | 133.4 | 133.4 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 81. | 307. | 111.6 | 111.6 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 95. | 352. | 96.42 | 96.42 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 115. | 400. | 83.99 | 83.99 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 133. | 448. | 74.18 | 74.18 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 125. | 496. | 66.25 | 66.25 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 134. | 550. | 58.97 | 58.97 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 136. | 600. | 53.37 | 53.37 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 120. | 648. | 48.81 | 48.81 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 135. | 700. | 44.57 | 44.57 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 129. | 800. | 38.09 | 38.09 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 117. | 908. | 32.72 | 32.72 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 138. | 1007. | 28.83 | 28.83 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 148. | 1104. | 25.75 | 25.75 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 213. | 1203. | 23.14 | 23.14 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 242. | 1302. | 20.94 | 20.94 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 255. | 1390. | 19.27 | 19.27 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 257. | 1502. | 17.43 | 17.43 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 251. | 1600. | 16.05 | 16.05 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 223. | 1703. | 14.79 | 14.79 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 310. | 1800. | 13.74 | 13.74 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 293. | 1900. | 12.77 | 12.77 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 264. | 2001. | 11.91 | 11.91 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 328. | 2511. | 8.816 | 8.816 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 477. | 3003. | 6.919 | 6.919 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 536. | 3517. | 5.616 | 5.616 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 623. | 4016. | 4.706 | 4.706 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 681. | 4496. | 4.043 | 4.043 | 68.3 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |

**********
*** SUMMARY OF SCREEN MODEL RESULTS ***
**********

| CALCULATION PROCEDURE | MAX CONC (UG/M**3) | DIST TO MAX (M) | TERRAIN HT (M) |
|---|---|---|---|
| COMPLEX TERRAIN | 133.4 | 259. | 71. (24-HR CONC) |

03/05/09
08:57:34

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Tajiguas Flare

COMPLEX TERRAIN INPUTS:
SOURCE TYPE = POINT
EMISSION RATE (G/S) = 1.47420
STACK HT (M) = 13.7160
STACK DIAMETER (M) = 2.4384
STACK VELOCITY (M/S) = 5.3645
STACK GAS TEMP (K) = 1116.4833
AMBIENT AIR TEMP (K) = 293.1500
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 57.664 M**4/S**3; MOM. FLUX = 11.232 M**4/S**2.

FINAL STABLE PLUME HEIGHT (M) = 83.9
DISTANCE TO FINAL RISE (M) = 151.4

| | | *VALLEY 24-HR CALCS* | | **SIMPLE TERRAIN 24-HR CALCS** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TERR HT (M) | MAX 24-HR DIST (M) | MAX 24-HR CONC (UG/M**3) | PLUME HT CONC (UG/M**3) | PLUME HT ABOVE STK BASE (M) | PLUME HT CONC (UG/M**3) | PLUME HT ABOVE STK HGT (M) | SC | U10M (M/S) | USTK |
| 31. | 96. | 14.57 | 14.57 | 65.6 | 1.872 | 15.0 | 4 | 20.0 | 21.0 |
| 42. | 148. | 12.56 | 12.56 | 82.9 | 10.59 | 15.0 | 4 | 20.0 | 21.0 |
| 49. | 194. | 17.56 | 17.56 | 83.9 | 15.40 | 15.0 | 4 | 20.0 | 21.0 |
| 71. | 259. | 45.99 | 45.99 | 83.9 | 16.32 | 15.0 | 4 | 20.0 | 21.0 |
| 81. | 307. | 41.69 | 41.69 | 83.9 | 15.13 | 15.0 | 4 | 20.0 | 21.0 |
| 95. | 352. | 36.11 | 36.11 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 115. | 400. | 31.53 | 31.53 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 133. | 448. | 27.92 | 27.92 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 125. | 496. | 25.00 | 25.00 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 134. | 550. | 22.32 | 22.32 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 136. | 600. | 20.26 | 20.26 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 120. | 648. | 18.58 | 18.58 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 135. | 700. | 17.02 | 17.02 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 129. | 800. | 14.62 | 14.62 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 117. | 908. | 12.63 | 12.63 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 138. | 1007. | 11.18 | 11.18 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 148. | 1104. | 10.03 | 10.03 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 213. | 1203. | 9.053 | 9.053 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 242. | 1302. | 8.227 | 8.227 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 255. | 1390. | 7.594 | 7.594 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 257. | 1502. | 6.900 | 6.900 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 251. | 1600. | 6.376 | 6.376 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 223. | 1703. | 5.893 | 5.893 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 310. | 1800. | 5.492 | 5.492 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 293. | 1900. | 5.123 | 5.123 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 264. | 2001. | 4.791 | 4.791 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 328. | 2511. | 3.585 | 3.585 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 477. | 3003. | 2.838 | 2.838 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 536. | 3517. | 2.318 | 2.318 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 623. | 4016. | 1.952 | 1.952 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |
| 681. | 4496. | 1.684 | 1.684 | 83.9 | 0.000 | 0.0 | 0 | 0.0 | 0.0 |

**********
*** SUMMARY OF SCREEN MODEL RESULTS ***
**********

| CALCULATION PROCEDURE | MAX CONC (UG/M**3) | DIST TO MAX (M) | TERRAIN HT (M) |
|---|---|---|---|
| COMPLEX TERRAIN | 45.99 | 259. | 71. (24-HR CONC) |