

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

August 10, 2012

**PERMIT TO INSTALL
77-12**

**ISSUED TO
Riverview Land Preserve**

**LOCATED AT
20863 Grange Road
Riverview, Michigan**

**IN THE COUNTY OF
Wayne**

**STATE REGISTRATION NUMBER
M4469**

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

June 14, 2012

DATE PERMIT TO INSTALL APPROVED:

August 10, 2012

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

PERMIT TO INSTALL

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Common Abbreviations / Acronyms

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
BACT	Best Available Control Technology	°C	Degrees Celsius
CAA	Clean Air Act	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	dscf	Dry standard cubic foot
CFR	Code of Federal Regulations	dscm	Dry standard cubic meter
CO ₂ e	Carbon Dioxide Equivalent	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H ₂ S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
GHGs	Greenhouse Gases	kW	Kilowatt
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfuction Abatement Plan	NO _x	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MSDS	Material Safety Data Sheet	PM10	PM less than 10 microns diameter
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	PM less than 2.5 microns diameter
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonably Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	SO ₂	Sulfur Dioxide
SCR	Selective Catalytic Reduction	THC	Total Hydrocarbons
SRN	State Registration Number	tpy	Tons per year
TAC	Toxic Air Contaminant	µg	Microgram
TEQ	Toxicity Equivalence Quotient	VOC	Volatile Organic Compound
VE	Visible Emissions	yr	Year

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EUTEMPFLARE	3,000 CFM open flare for control of the landfill gas.	*	NA
EUFLARE2	4,000 CFM open flare for control of the landfill gas.	*	NA
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

The following conditions apply to: EUTEMPFLARE

DESCRIPTION: 3,000 CFM open flare for control of the landfill gas. This flare is temporary until EUFLARE2 is installed.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: NA

I. EMISSION LIMITS

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Visible Emissions	0% opacity	SC III.3	EUTEMPFLARE	SC V.1	40 CFR §60.18(c)(1)

II. MATERIAL LIMITS

NA

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall operate the flare in accordance with 40 CFR §60.18. **(40 CFR §60.752(b)(2)(iii)(A), 40 CFR §63.1955(a))**
2. The permittee shall operate the flare at all times when the collected gas is routed to it. **(40 CFR §60.753(f), 40 CFR §63.1955(a))**
3. The flare shall be designed for and operated with no visible emissions, as determined by the methods specified in 40 CFR §60.18(f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. **(40 CFR §60.18(c)(1))**

- The flare shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR §60.18(f). **(40 CFR §60.18(c)(2))**

IV. DESIGN/EQUIPMENT PARAMETERS

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

- Within 60 days after achieving maximum production rate, but not later than 180 days after commencement of initial startup, the permittee shall evaluate visible emissions from EUTEMPFLARE, as required by federal Standards of Performance for New Stationary Sources, at owner's expense, in accordance with 40 CFR Part 60 Subparts A (60.18) and WWW. Visible emission observation procedures must have prior approval by the AQD. Verification of visible emissions includes the submittal of a complete report of opacity observations to the AQD within 60 days following the last date of the evaluation. **(40 CFR Part 60 Subparts A (60.18) & WWW)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVTEMPFLARE	12	42	R 336.1225, R 336.1702, R 336.2803, R 336.2804, 40 CFR 52.21 (c) and (d)

IX. OTHER REQUIREMENTS

- Upon startup of EUFLARE2, EUTEMPFLARE shall be removed from service at the facility and this section (EUTEMPFLARE) of PTI 77-12 will be void. **(R 336.1201(3))**
- The permittee shall comply with all applicable provisions of 40 CFR Part 60 Subpart A and WWW "Standard of Performance for Municipal Solid Waste Landfills as they apply to EUTEMPFLARE. **(40 CFR Part 60 Subpart A and WWW)**

3. The permittee shall comply with all applicable provisions of 40 CFR Part 63 Subpart A and AAAA "National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills as they apply to EUTEMPFLARE. **(40 CFR Part 60 Subpart A and AAAA)**

Footnotes:

¹This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

The following conditions apply to: EUFLARE2

DESCRIPTION: 4,000 CFM open flare for control of the landfill gas.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT: NA

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Visible Emissions	0% opacity	III.3	EUFLARE2	SC V.2, SC V.3	40 CFR §60.18(c)(1)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Net heating value of landfill gas	≥ 200 Btu/scf for non-assisted flares	NA	EUFLARE2	SC V.1	40 CFR §60.18(c)(3)

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall operate the flare in accordance with 40 CFR §60.18. **(40 CFR §60.752(b)(2)(iii)(A), 40 CFR §63.1955(a))**
2. The permittee shall operate the flare at all times when the collected gas is routed to it. **(40 CFR §60.753(f), 40 CFR §63.1955(a))**
3. The flare shall be designed for and operated with no visible emissions, as determined by the methods specified in 40 CFR §60.18(f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. **(40 CFR §60.18(c)(1))**
4. The flare shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR §60.18(f). **(40 CFR §60.18(c)(2))**
5. The flare shall be used only with the net heating value of the gas being combusted of 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted of 7.45 MJ/scm (200 Btu/scf) or greater if the flare is non-assisted. The net heating value of the gas being combusted shall be determined by the methods specified in 40 CFR §60.18(f). **(40 CFR §60.18(c)(3))**
6. Steam-assisted and non-assisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR §60.18(f)(4), less than 18.3 m/sec (60 ft/sec), except as provided in 40 CFR §60.18(c)(4)(ii) and (iii). **(40 CFR §60.18(c)(4)(i))**

- a. Steam-assisted and non-assisted flares designed for and operated with an exit velocity, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf). **(40 CFR §60.18(c)(4)(ii))**
- b. Steam-assisted and non-assisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR §60.18(f)(4) less than the velocity, V_{max} , as determined by the method specified in 40 CFR §60.18(f)(5), and less than 122 m/sec (400 ft/sec) are allowed. **(40 CFR §60.18(c)(4)(iii))**
7. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, V_{max} , as determined by the method specified in 40 CFR §60.18(f)(6). **(40 CFR §60.18(c)(5))**
8. Flares used to comply with provisions of 40 CFR Part 60 Subpart A shall be operated at all times when emissions may be vented to them. **(40 CFR §60.18(e))**
9. The permittee shall operate the control system such that all collected gases are vented to a control system designed and operated in accordance with §60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within one hour. **(40 CFR §60.753(e), 40 CFR §63.1955(a))**

IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. **(R 336.1213(3)(b)(ii))**

1. For the performance test required in 40 CFR §60.752(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in 40 CFR §60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR §60.18(f)(4). **(40 CFR §60.752(b)(2)(iii)(A), 40 CFR §60.754(e))**
2. Within 60 days after achieving maximum production rate, but not later than 180 days after commencement of initial startup, the permittee shall evaluate visible emissions from EUFLARE2, as required by federal Standards of Performance for New Stationary Sources, at owner's expense, in accordance with 40 CFR Part 60 Subparts A (60.18) and WWW. Visible emission observation procedures must have prior approval by the AQD. Verification of visible emissions includes the submittal of a complete report of opacity observations to the AQD within 60 days following the last date of the evaluation. **(40 CFR Part 60 Subparts A (60.18) & WWW)**
3. Method 22 of appendix A to 40 CFR Part 60 shall be used to determine the compliance of EUFLARE2 with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22. **(40 CFR §60.18(f)(1), 40 CFR §60.752(b)(2)(iii)(A))**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. **(R 336.1201(3))**

1. The permittee shall install, calibrate, maintain, and operate, according to the manufacturer's specifications, a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame. **(40 CFR §60.756(c)(1), 40 CFR §63.1955(a))**
2. Except as provided in 40 CFR §60.752(b)(2)(i)(B), the permittee shall keep up-to-date, readily accessible records for the life of the open flare of the data listed in SC VI.3, as measured during the initial performance

test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the open flare vendor specifications shall be maintained until removal. **(40 CFR §60.758(b), 40 CFR §63.1955(a))**

3. The permittee shall maintain records regarding the flare type (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in 40 CFR §60.18; continuous records of the open flare pilot flame or open flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent. **(40 CFR §60.758(b)(4), 40 CFR §63.1955(a))**
4. The following records for the flare shall be maintained onsite:
 - a. Records indicating presence of flare pilot flame. **(40 CFR §60.18(f)(2))**
 - b. The net heating value of the gas being combusted in the flare shall be calculated and recorded using the equation provided in Appendix A. **(40 CFR §60.18(f)(3))**
 - c. The actual exit velocity of the flare shall be calculated and recorded by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Federal Reference Test Methods 2, 2A, 2C, or 2D as appropriate, by the unobstructed (free) cross sectional area of the flare tip. **(40 CFR §60.18(f)(4))**
 - d. The maximum permitted velocity, V_{max} , for flares complying with 40 CFR §60.18(c)(4)(iii) shall be calculated and recorded using the equation provided in Appendix A. **(40 CFR §60.18(f)(5))**
 - e. The maximum permitted velocity, V_{max} , for air-assisted flares shall be calculated and recorded using the equation provided in Appendix A. **(40 CFR §60.18(f)(6))**

VII. REPORTING

1. The permittee shall submit to the appropriate AQD District Office semi-annual reports for the gas collection system. Reports shall be postmarked or received by appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. For enclosed combustion devices and flares, reportable exceedances are defined under §60.758(c). The semi-annual report shall contain:
 - a. Value and length of time for exceedance of applicable parameters monitored under §60.756(b). **(40 CFR §60.757(f)(1), 40 CFR §63.1980(a), 40 CFR §63.1955(a))**
 - b. Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time the control device was not operating. **(40 CFR §60.757(f)(3), 40 CFR §63.1980(a), 40 CFR §63.1955(a))**
2. The permittee shall submit the startup, shutdown, and malfunction (SSM) report to the appropriate AQD district office and it shall be delivered or postmarked by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(40 CFR §63.10(a)(5), 40 CFR §63.10(d)(5))**
3. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EUFLARE2. **(R 336.1201(7)(a))**

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVFLARE2	16	46	R 336.1225, R 336.1702, R 336.2803, R 336.2804, 40 CFR 52.21 (c) and (d)

IX. OTHER REQUIREMENTS

1. The duration of start-up, shutdown, or malfunction for the open flare shall not exceed 1 hour. **(40 CFR §60.755(e), 40 CFR §63.1955(a))**
2. Compliance with 40 CFR Part 63, Subpart AAAA is determined in the same way it is determined for 40 CFR Part 60, Subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data collected above in SC VI.1 are used to demonstrate compliance with the operating conditions for the open flare. The permittee shall have developed and implemented a written SSM for EUFLARE2. A copy of the SSM plan shall be maintained on site. **(40 CFR §63.1960)**
3. The permittee shall comply with all applicable provisions of 40 CFR Part 60 Subpart A and WWW “Standard of Performance for Municipal Solid Waste Landfills as they apply to EUFLARE2. **(40 CFR Part 60 Subpart A and WWW)**
4. The permittee shall comply with all applicable provisions of 40 CFR Part 63 Subpart A and AAAA “National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills as they apply to EUFLARE2. **(40 CFR Part 60 Subpart A and AAAA)**

Footnotes:

¹This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

APPENDIX A

Net Heating Value of the gas being combusted in the flare:

The net heating value of the gas being combusted in the flare shall be calculated and recorded using the equation provided in 40 CFR §60.18(f)(3). **(40 CFR §60.18(f)(3))**

$$H_T = K \sum_{i=1}^n C_i H_i$$

WHERE:

H_T = Net heating value of the sample, MJ/scm;

where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C;

$$K = \text{Constant}, 1.740 \times 10^{-7} \left(\frac{1}{\text{ppm}} \right) \left(\frac{\text{g mole}}{\text{scm}} \right) \left(\frac{\text{MJ}}{\text{kcal}} \right)$$

where the standard temperature for $\left(\frac{\text{g mole}}{\text{scm}} \right)$ is 20°C;

C_i = Concentration of sample component i in ppm on a dry basis, as measured by Reference Method 3C (40 CFR §60.754(e)); and

H_i = Net heat of combustion of sample component i , kcal/g mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382–76, 88 (incorporated by reference as specified in §60.17(30)) or D4809–95 (incorporated by reference as specified in §60.17(56)) if published values are not available or cannot be calculated.

Calculation for Vmax steam-assisted and non-assisted flares:

The maximum permitted velocity, V_{\max} , for flares complying with 40 CFR §60.18(c)(4)(iii) shall be calculated and recorded using the equation provided in 40 CFR §60.18(f)(5). **(40 CFR §60.18(f)(5))**

$$\text{Log}_{10} (V_{\max}) = (HT+28.8)/31.7$$

V_{\max} = Maximum permitted velocity, M/sec

28.8=Constant

31.7=Constant

HT= The net heating value as determined above.

Calculation for Vmax for air-assisted flares:

The maximum permitted velocity, V_{\max} , for air-assisted flares shall be calculated and recorded using the equation provided in 40 CFR §60.18(f)(6). **(40 CFR §60.18(f)(6))**

$$V_{\max} = 8.706+0.7084 (HT)$$

V_{\max} = Maximum permitted velocity, m/sec 8.706=Constant 0.7084=Constant HT=The net heating value as determined above.