

Section II: Other LAER/BACT Determinations

Application No.: TP-B-0482

Equipment Category – Flare, Landfill Gas from Non-Hazardous Waste Landfill

1. GENERAL INFORMATION		DATE: 4/18/2006
A. MANUFACTURER: John Zink Co.		
B. TYPE: Enclosed Ground Flare	C. MODEL: ZULE	
D. STYLE: Forced Air		
E. APPLICABLE AQMD RULES:		
F. COST: \$ (NA)	SOURCE OF COST DATA:	
G. OPERATING SCHEDULE:	24 HRS/DAY	7 DAYS/WK
		52 WKS/YR

2. EQUIPMENT INFORMATION		APP. NO.: TP-B-0482
A. FUNCTION: Burns product gas from decomposing landfill waste.		
B. MAXIMUM HEAT INPUT: 115.5 MMBtu/hr (design)	C. MAXIMUM THROUGHPUT: 3500 scfm (design)	
D. BURNER INFORMATION: NO.: Multiple TYPE: 24" dia. coiled tip, premix		
E. PRIMARY FUEL: Landfill Gas	F. OTHER FUEL:	
G. OPERATING CONDITIONS: Steady at approx. 3000-3200 scfm input.		

3. COMPANY INFORMATION		APP. NO.: TP-B-0482
A. NAME: Waste Management of New Hampshire		B. SIC CODE: 4953
C. ADDRESS: Turnkey Recycling & Environmental Enterprise, 64 Turnkey Way CITY: Rochester STATE: NH ZIP:		
D. CONTACT PERSON: Bill Howard		E. PHONE NO.: 603-330-2105

4. PERMIT INFORMATION		APP. NO.: TP-B-0482
A. AGENCY: New Hampshire Dept. of Environmental Services	B. APPLICATION TYPE: new construction	
C. AGENCY CONTACT PERSON: Michelle Andy	D. PHONE NO.: 603-271-6793	
E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: <input type="checkbox"/> CHECK IF NO P/C	P/C NO.: TP-B-0482 P/O NO.: TP-B-0482	ISSUANCE DATE: 11/26/2001 ISSUANCE DATE: 1/6/2003
F. START-UP DATE: June 2002		

5. EMISSION INFORMATION		APP. NO.: TP-B-0482
A. PERMIT		
A1. PERMIT LIMIT: Maximum lb/hr emissions: NO _x -2.9, CO-6.93, PM ₁₀ -2.32, SO ₂ -1.66. NMOC-98% destruction efficiency or 20 ppm@3%O ₂ as hexane.		

5. EMISSION INFORMATION

APP. NO.: TP-B-0482

A2. BACT/LAER DETERMINATION: Lb/MMbtu limits: NO_x-.025, CO-.06. Lb/hr limits in 5A1 were based on these maximum concentrations (design was for 550 Btu/scf landfill gas, 3500 scfm input).

A3. BASIS OF THE BACT/LAER DETERMINATION: Vendor guarantee

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: John Zink Co.

B2. TYPE: Low-emission burner system

B3. DESCRIPTION: Landfill gas and air are premixed prior to entering the flare. This requires an air blower as opposed to natural draft used in conventional landfill gas flares. The burners are enlarged relative to conventional landfill gas flare burners to accommodate the larger volume throughput. Landfill gas and air are injected to the mixer at 15 In. W.C. versus 5 In. W.C. landfill gas pressure used in conventional flare.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: ISSUANCE DATE:
P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: BLOWER HP:

B6. WARRANTY: .025 lb/MMbtu NO_x, .06 lb/MMBtu CO

B7. PRIMARY POLLUTANTS: VOC

B8. SECONDARY POLLUTANTS: NO_x, CO

B9. SPACE REQUIREMENT: Flare dimensions 12.5' D x 44' H. Additional plan area required for air blower and duct, venturi flow meter and static mixer.

B10. LIMITATIONS:

B11. UNUSED

B12. OPERATING HISTORY: After extensive de-bugging, including total burner replacement, the flare began regular operation in June 2002. Problems were also experienced with burner pluggage in cold weather. A system was added to warm, dry and clean the inlet air. Facility personnel believe that the inadequacies in the original design were all corrected and plan to purchase a second ZULE flare

B13. UNUSED

B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: \$ INSTALLATION: \$ (NA) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: \$ (NA) SOURCE OF COST DATA:

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERFORMING FIELD EVALUATION:

ENGINEER'S NAME: INSPECTOR'S NAME: Pamela Monroe DATE: 12/1/2005

D2. COMPLIANCE DEMONSTRATION: The facility is required to report all flare malfunctions. Based on data received to date, the flare is operating satisfactorilly.

D3. VARIANCE: NO. OF VARIANCES: None DATES:
CAUSES:

5. EMISSION INFORMATION

APP. NO.: TP-B-0482

D4. VIOLATION:	NO. OF VIOLATIONS: None	DATES:	
CAUSES:			
D5. MAINTENANCE REQUIREMENTS:	D6. UNUSED		
D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:			
DATE OF SOURCE TEST: 7/11/2002, 6/29/2005		CAPTURE EFFICIENCY:	
DESTRUCTION EFFICIENCY:		OVERALL EFFICIENCY:	
SOURCE TEST/PERFORMANCE DATA:			
Date		7/11/2002	6/29/2005
LFG Flow, scfm	3451	3888	3646
%CH4	51.5	51.7	-----
Btu/scf (HHV)	513.9	515.2	-----
CO2, % (dry)	7.3	7.2	8.0
O2, % (dry)	12.4	12.6	12.3
H2O, %	8.8	8.2	7.6
NOx, lb/MMBtu (ppmvd@15%O2)	.014 (3.6)	.018 (4.6)	(1.6)
CO, lb/MMBtu (ppmvd@15%O2)	.013 (5.3)	.009 (3.9)	-----
NMOC, lb/MMBtu (ppmvd@15%O2)	<.0014 (<0.5)	<.0014 (<0.5)	-----
OPERATING CONDITIONS:			
TEST METHODS: NOx-USEPA Method 7E, CO-USEPA Method 10, NMOC-USEPA Method 18 using GC/FID. Data at 3451 scfm are averages of three 1-hr tests. Data at 3888 scfm are averages of two 1-hr tests.			

6. COMMENTS

APP. NO.: TP-B-0482

The facility reports that the flare control system is somewhat complex, and special operator training was required. The facility added an inlet air pre-conditioning system consisting of a filter house to eliminate any condensed moisture, a flow straightener to reduce a surging problem they were having and a heater to eliminate ice particle formation on exceptionally cold days.