918-294-3868 Fax: 918-294-9897



August 19, 2013

Dr. Capelo

Attn. Jose Capelo

RE: One 250 scfm Skid-Utility Landfill Gas Flare System

#### Gentleman:

The solution to landfill gas control begins with selecting a company that specializes in just that! Parnel Biogas Inc. is dedicated to supplying quality landfill gas flaring equipment and service.

As a company Parnel Biogas Inc. offers:

- The latest and best available Landfill Gas Control Technology
- Flare performance guarantees
- Qualified service personnel
- And the commitment to respond to your Landfill Gas Flaring needs, immediately

Parnel Biogas Inc. Landfill Gas Flares meet the stringent operating requirements set forth by the major landfill operators. The flare combustion chamber is designed to provide the necessary residence time to completely combust the landfill gas. The control system is designed to operate one or two gas blowers and will operate the flare in manual and automatic in a trouble free and safe manner.

THIS INFORMATION IS PROPRIETARY TO PARNEL BIOGAS INC.

Parnel Biogas Inc. Proposal # 8192013 August 19, 2013 Parnel Biogas Inc. though extensive field experience has improved on conventional flare designs in the following areas:

- Parnel Biogas Inc. Utility Flares are designed to prevent flame instability and flame lift off.
- Parnel Biogas Inc. Utility Flare tips are constructed of stainless steel with an integral flame holder to provide superior flame retention even in high wind conditions.
- State of the art PLC control burner management
- Guaranteed emission values
- The Parnel Biogas Inc. proprietary pilot is designed exclusively for Landfill Gas service to provide superior pilot performance and trouble free operation.

Parnel Biogas Inc. would like to earn the opportunity of being your preferred Landfill Gas Flare supplier. We enjoy discussing this proposal with you in detail at your convenience

Sincerely

Jeff Parker Process Engineer

## Page 3

# **Process Specifications**

Landfill Gas Flow rate (max) 250 scfm

Landfill Gas Flow rate (min) 25 scfm

Flare exit velocity (not to exceed) 60.0 ft/sec

Landfill Gas Composition:

Methane 50%

CO2, N2, O2, VOC's, H2O, H2S 50%

Heat Release (max) 6.8 MMBtu/hr

Inlet Pressure to flare 10" WC (approx)

Blower motor Horsepower 5 hp 230v/1/60

Design wind load per ASCE 7-93 110mph

Noise level at 3ft. < 85dba

Design ambient air temperature -30F to 110F

Electrical Service 380/50/3 or 220/50/1

Electrical Area Non-hazardous

Classification

## **Expected** Flow/Emissions at 250scfm, 50% methane:

N2 73.5 % vol.

O2 13.6 % vol.

CO2 6.0 % vol.

H2O 6.9 % vol.

NO2 0.04 lbs/MMBTU

CO 0.37 lbs/MMBTU

Destruction efficiency at design flow with landfill gas methane content of 40% to 60%---98% overall destruction of total hydrocarbons.

Guaranteed to meet E.P.A. emission standards for landfill gas utility type flares. Designed in accordance of EPA established criteria for open flares 40 CFR 60.18

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## **Skid Mounted Utility Flare System**

- One (1) Skid mounted 3" x 20' Flare stack constructed of A-53 sch.40 pipe, with 4" x 5' 304 Stainless Steel tip. Parnel Biogas Inc. 316 ss flame retention ring, 24" x 4' 316 ss 10ga. Windshield to help retain flame at the tip and provide retention time for efficient combustion.
- One (1) 3" tee 150# flanged inlet with 1" drain connection
- One (1) 3" flame arrestor aluminum construction and aluminum arrestor bank assembly.
- One (1) Landfill gas blower
- One (1) Pneumatic fail close valve
- One (1) manual valve with gear operator for blower throttling
- One (1) Manual valve with gear operator on blower outlet for isolation

## Pilot and Igniter assembly

One (1) Parnel Biogas Inc. proprietary pilot assembly. The Pilot is constructed of 304 stainless steel with a 310 stainless steel tip.

## **CONTROL SYSTEM OPERATION (Generic)**

The following is a brief outline of the control system operation:

System start-up (in the automatic mode) the pilot gas solenoid valve is opened to allow propane gas to the pilot assembly the igniter is pulsed to light the pilot tip. Once the pilot is detected, a signal is sent to the PLC to initiate the main flame light off sequence. Upon pilot prove the Landfill gas fail close valve is opened and the Landfill gas blower is started. Once the main flame is proved, the pilot is shut down to limit propane usage. Upon main flame loss both the waste gas valve would be closed and the landfill gas blower would be shut off. Automatic re-ignition will attempt resuming normal flare operation. If pilot re-ignition or main flame prove does not occur within a specified period of time the flare would shut down and a signal to a alarm beacon if so equipped, to notify system operator of shutdown.

### **SKID-MOUNTED CONTROL SYSTEM COMPONENTS:**

One (1) Rain / Sun Shield

Master control cabinet including PLC, panel heater, Yokogawa 4 channel digital recorder, interior panel light, pilot and automatic flare control systems.

Pilot gas pressure control

Pilot and main flame detection

Motor starter panel including landfill gas blower Motor starter, blower control circuit breaker, step-down transformer surge protection.

All necessary lights and switches for proper operation of flare system in manual and automatic modes. Lamp test push button to confirm operation of panel lights.

Safety disconnect

One (1) 380v/110v step down transformer

One (1) Convenience outlet mounted outside panel

One (1) Pilot supply line skid mounted with strainer solenoid valve, block valve and pressure gauge.

### **FLAME ARRESTOR**

One (1) 3" Flame arrestor all aluminum construction aluminum construction.

### **FAIL-CLOSE VALVE**

One (1) 3" Xomox fail close high performance butterfly valve. Valve has carbon steel body, 316ss disk, PTFE seals, pneumatic actuator.

## **LANDFILL GAS BLOWER**

One (1) Landfill Gas blower with at design flow rate of 250 scfm @ a minimum of –30" wc inlet suction and 10" wc discharge pressure. Blower will be supplied with a 5hp premium efficiency TEFC motor, belt driven, and double lip shaft seal. All would be mounted on a unitary base and factory aligned. Blower would include coated internals, Type B spark resistant, current transformer with ammeter.

### THERMAL FLOWMETER

One (1) Thermal flow meter ½" OD, 316ss, 1/2" NPT mounting connection, and electronics installed. The thermal meters have digital displays for instantaneous flow and totalization are not susceptible to ambient temperatures or dirty working environments. This Flowmeter retains its accuracy over the full range of flow rates, unlike the orifice plate system.

#### **KNOCK OUT POT**

One (1) 3' x 4' 304 stainless steel knock out pot with 4" inlet with block valve and 4" outlet. Removable lid, PVC sight glass, high level shutdown, 2" PVC drain and a integral stainless steel demister pad, differential pressure indication.

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One Parnel Biogas Inc. 250scfm Skid Mounted Utility Landfill Flare System.

FIRM PRICE.....\$ 85,281.00 US

## **OPTIONS**

### **RECOMMENDED SPARE PARTS**

Two (2) Thermocouple assemblies

**SPARE PARTS PRICE......\$650.00** 

Shipping and Handling not included in price

System Start-up if needed will be billed \$1200 a day plus expenses

System can be shipped 12-14 weeks after receipt of purchase order.

If customer drawing approval is needed this would extend shipping date.

## The following are to be provided by the customer:

Electrical service connection

Receiving, unloading, inspection of equipment

Interconnecting piping from Landfill header to equipment

Erection and installation of all equipment

Pilot gas propane supply and piping

## The following are to be provided by Parnel Biogas Inc.

General arrangement drawings

P&ID's

Electrical interconnect drawings

**Shipping Lists** 

Instrument and equipment specifications

Three copies of operations manuals

# Parnel Biogas Inc. Sales inside the US

FOB POINT: All equipment is FOB Point of Manufacture

**This proposal** is void after 45 days. Acceptance of any order is at the sole discretion of Parnel Biogas Inc. Credit approval and agreement by the buyer to Parnel Biogas Inc. Terms and conditions

**Pricing:** Pricing quoted in this proposal is based on the total quantity of items being offered. Partial orders or changes in quantity may necessitate a change in pricing unless stated otherwise in the body of this proposal, No taxes or duties are included in pricing. Pricing is based upon the specifications provided to Parnel Biogas Inc. by the customer and referenced in this proposal. Additions to or changes will result in changes in pricing. The pricing presented in this proposal is based on the following payment terms.

35% upon receipt of purchase order 25% upon submittal of drawings 20% upon start of fabrication 15% upon Half-fabrication 5% Upon shipment

**Invoices:** Invoices are due net 30 days. Past due invoices will be charged interest at prime plus 1.5%.

**Delivery:** The delivery dates presented in this proposal are preliminary. The actual dates are variable dependent on variables at the time of the order and will also be affected by (1) SCOPE CHANGES MADE BY THE BUYER (2) DELAYS BY THE BUYER IN APPROVING DRAWINGS (3) OR ANY OTHER DELAYS BY BUYERS IN PERFORMING ITS OTHER OBLIGATIONS UNDER THIS ORDER.

### **TERMS AND CONDITIONS**

LIMITATIONS OF LIABILTY: Under no circumstances shall Parnel Biogas Inc. be responsible for loss of use/loss profit, incidental, consequential, indirect, or special damages, nor shall Parnel Biogas Inc. total aggregate liability under this purchase order exceed the value of the purchase order.

**WARRANTY:** Parnel Biogas Inc. warrants the equipment to be free from defects in material or workmanship for 18 months from date of notification to ship or 12 months after start-up whichever occurs first. Vendor- supplied items will carry standard vendor warranties, which will be transferred to the end user. This warranty shall be for repair or replacement, at Parnel Biogas Inc. option, of any defective parts, FOB point of manufacture. All cost for labor, equipment, and/or material costs for removal and/or reinstallation of parts, are expressly excluded for this warranty

ALL WARRANTIES SHALL BE VOIDED, AND BUYER AGREES TO INDEMNIFY AND HOLD Parnel Biogas Inc. HARMLESS FROM, ANY CLAIM OF LIBILITY BY ANYONE IF: (1) ANY REPAIRS, ALTERATIONS, MODIFICATIONS, OR DISASSEMBLIES ARE MADE WITHOUT Parnel Biogas Inc. APPROVAL OR IN VIOLATION OF THE OPERATING MANUAL INSTRUCTIONS; (2) ANY REPLACEMNET PARTS ARE USED ON THE EQUIPMENT OTHER THAN THOSE SUPPLIED OR APPROVED BY Parnel Biogas Inc.; (3) THE EQUIPMENT IS USED FOR ANY OTHER USE OR MANNER THAN IT WAS ORIGINALLY DEIGNED (4) OR SYSTEM IS NOT OPERATED IS STRICT ACCORDANCE WITH THE MANUAL. The above warranty is the sole and exclusive guaranty and warranty provided by Parnel Biogas Inc. and all other warranties or guarantees (express, implied, in law or In equity, including warranties of merchantability and fitness for a particular purpose) are hereby disclaimed and excluded. Parnel Biogas Inc. total aggregate liability with regard to warranties shall not exceed the order amount.

**CHANGES** Many small changes may significantly affect both price and schedule. A design freeze will be placed on the project prior to release for fabrication and the buyer notified of this date. If the buyer desires to make changes in quantities or goods or work, in specifications or drawings governing the goods of the work, or otherwise amend or modify the Purchase Order, it shall deliver a change order to Parnel Biogas Inc. If within 30 days the buyer and Parnel Biogas Inc. are unable to reach an agreement regarding changes in Price or time of delivery, this Purchase Order shall remain in effect as originally issued. And any time used in attempting to resolve the problems in design shipping date ect. Will be automatically added to the buyer's delivery date. Any changes made after the design freeze may incur additional costs to the buyer and have affects of the shipping date.

**PATENTS** Under no circumstances, shall a patent infringement indemnity granted by Parnel Biogas Inc. if any, apply to any equipment, or any part thereof, manufactured to buyers design or to changes in Parnel Biogas Inc. design requested by the buyer. As to such equipment or part, Parnel Biogas Inc. assumes no liability whatsoever for patent infringement. Further, such an indemnity, if any, will be expressly conditioned upon the buyer's agreement to notify Parnel Biogas Inc. of any claim of suit or proceeding in which such infringement by the buyer is alleged, and buyer, shall permit Parnel Biogas Inc. to control completely the defense of compromise of any such claim, suit, or proceeding, and buyer shall render such reasonable assistance in the defense thereof as Parnel Biogas Inc. may require

**CANCELLATION** Any Purchase Order resulting from this proposal may be cancelled by the buyer for its convenience by giving Parnel Biogas Inc. written notice of such cancellation. Upon receipt of such notice Parnel Biogas Inc. shall cease all of its own activity (except that related to the cancellation) and terminate under the most reasonably favorable terms all related subcontracts, as soon after such cancellation as reasonably practicable. Buyer shall pay the greater of (a) 25% of the total purchase order value or (b) Parnel Biogas Inc. costs incurred for this order to the point of cancellation, plus costs incurred in the termination of related subcontracts (including reasonable cancellation charges actually paid buy Parnel Biogas Inc. to its sub suppliers and reasonable costs incurred in preserving and protecting materials, work in progress, and completed goods), plus a reasonable allowance for overhead and profit on such costs, whichever is greater. However, in no event shall the amounts payable to Parnel Biogas Inc. in the cancellation under this paragraph exceed the total price of this order, less payment previously made by buyer to Parnel Biogas Inc. under this order.

**INDEMNITY** under no circumstances will Parnel Biogas Inc. indemnify buyer or other party for claims or losses which are not caused by the negligence or willful misconduct of Parnel Biogas Inc.

THIS INFORMATION IS PROPRIETARY TO PARNEL BIOGAS INC

**ALTERNATE DISPUTE RESOLUTION** If a dispute arises concerning or related to this agreement, it is the express intent of the parties hereto that they both commit to enter into good faith efforts to resolve the dispute at a meeting or meetings in which officials from both parties who have the authority to settle the dispute shall participate. The purpose of such negotiations will be an honest effort to allow each party an opportunity to determine if the dispute is resolvable prior to expensive and lengthy litigation. The parties shall have complete discretion as to what procedures shall be used and what agenda shall be discussed. Any such negotiation or series of negotiations shall be held as confidential by all partiers, and the parties hereto do commit themselves that they shall not disclose either the existence of such proceedings or the content thereof. Any participation in or initiating of such discussions shall not be deemed to be admission of liability, and no statement made or provided in or related to such negotiations shall be construed as a statement against interest or otherwise disclosed or used in any proceeding involving the two parties.

If the dispute cannot be resolved at such meeting or meetings of senior officials, the parties agree to submit the dispute to nonbonding mediation by a mediator mutually selected by the parties. If the parties are unable to agree upon a mediator, then the mediator shall be appointed by the American Arbitration Association. In any event, the mediation shall take place within thirty (30) days of the date a party gives the other party written notice of its desire to mediate the dispute. The parties agree to start these negotiations prior to litigation being filed (injunctive relief exception) They will in no event start later than four (4) after litigations filed. If the party failing to participate in such meetings and mediation being filed is the party who filed the litigation, the party failing to participate in such meetings and mediation being filed shall be liable to the other party for the reasonable attorney costs and expenses of the other party for the reasonable attorney costs and expenses of the party incurred in seeking a stay of litigation pending the conclusion of such meeting and mediation.