SCOPE OF WORK

For

COGENERATION FACILITY
SAG MEDIA (ACTIVATED CARBON) SUPPLY,
REMOVAL, DISPOSAL AND RELOADING OF
VESSEL

At

Joint Meeting of Essex and Union Counties
500 South First Street
Elizabeth, NJ 07202

November 2015
SUPPLY AND DELIVERY OF SAG MEDIA
Provide cost to supply and deliver 5,000 lbs. of new media in accordance with the enclosed specifications.

Total Price to supply and deliver 5,000 lbs. of new media

$ ____________________________________________

________________________________________ (WORDS)

REMOVAL AND RELOADING OF SAG VESSEL
Provide all labor and equipment to remove spent carbon media and reload vessel with new media in accordance with the enclosed specifications.

Total Price to remove media and reload vessel

$ ____________________________________________

________________________________________ (WORDS)

DISPOSAL OF SPENT MEDIA
Provide all labor and equipment to remove, haul, and dispose spent carbon media in accordance with the enclosed specifications. Contractor shall pay all fees related to the disposal of the spent carbon media including but not limited to laboratory tests, application fees, review fees, fuel surcharges, and tipping fees and shall include same in the total bid price.

Total Price to dispose of 5,000 lbs. of spent carbon media:

$ ____________________________________________

________________________________________ (WORDS)

NAME AND LOCATION OF APPROVED DISPOSAL SITE (LANDFILL):

________________________________________

________________________________________

________________________________________

Bidder Sign Here
SCOPE OF WORK

Project Description

The work for this contract involves the supply, removal, disposal and reloading of either one of the SAG (carbon) vessels located inside the Cogen Building. There are two SAG vessels in series, however, only one vessel will be worked on at any given time. Each vessel contains approximately 5,000 pounds of SAG media (activated carbon) utilized to remove siloxanes from the gas produced in the Joint Meeting's anaerobic digesters. The digester gas is used as a fuel to operate internal combustion engines in the cogeneration facility.

The media is contained in two vessels, both located inside the gas pretreatment room at the cogeneration facility. Both vessels are constructed of 304 stainless steel; each vessel has dimensions of 6 ft. diameter by 8 ft. height with a 6 ft. internal bed height.

It is highly recommended that the contractor visit the site to inspect the work areas before submitting a cost to perform the work.

Joint Meeting Responsibilities

The Joint Meeting will prepare the vessel for the contractor. We will isolate the vessel from the digester gas piping.

Contractor Responsibilities

Contractor must supply all labor and equipment necessary to remove all spent media; and transport and dispose of spent media (approx. 5,000 lbs.) in an approved landfill or to a facility for regeneration. Contractor will also supply and delivery 5,000 lbs. of new media to the site.

Contractor is advised that the working hours allowed for this project are between 7:00am to 3:30pm Monday through Friday. Overtime or premium pay will not be charged to the owner if the contractor is permitted to work beyond the typical eight hour work day or on a weekend or holiday.

The contractor must be familiar with all Federal, State, and local health & safety rules and regulations related to the work to be conducted to fulfill the requirements of this contract. The contractor must be in possession of an up-to-date Health and Safety Plan. A confined
space entry and hot work permit must be issued before the work may proceed each day. Safety equipment to be supplied by the contractor may include gas detection meters, personnel protection equipment/clothing, blowers, harnesses, etc. The contractor must bring their own locks and tags to properly lockout/tagout the equipment. The contractor is ultimately responsible for determining and providing the safety equipment necessary to perform the scope of work detailed in this contract. All contractor personnel working at the site must be trained in confined space entry procedures. The Joint Meeting will not issue confined space entry permits to the contractor nor provide any safety equipment.

A short safety orientation will be held with the Joint Meeting Safety Officer on the first day of work. Open flames, spark-producing procedures, cigarette smoking, etc. are NOT permitted in the vicinity of the work area (interior or exterior locations).

Any spills must be cleaned by the contractor immediately. Therefore the contractor shall have spill cleanup equipment onsite during the entire procedure.

**Technical Specifications**

1. **Supply and Delivery of New Media**

   a. **General**

   The media shall be specifically designed for the adsorption of siloxanes as proven in its use by the results of independent testing. The media shall separate the siloxanes from the biogas delivering a clean gas to a non-detectable level.

   The media shall be of uniform size, of high hardness, pelletized, and dust free to achieve maximum efficiency and to facilitate removal and replacement of media from the siloxane removal vessels. Media that does meet these requirements will be rejected.

   b. **Typical Media Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Standard Mesh Size</td>
<td>4x8</td>
</tr>
<tr>
<td>Percentage through 8 mesh</td>
<td>4.0</td>
</tr>
<tr>
<td>Activity (wt%)</td>
<td>60</td>
</tr>
<tr>
<td>Iodine Number (mg/g)</td>
<td>1050</td>
</tr>
<tr>
<td>Ash (wt%)</td>
<td>12</td>
</tr>
<tr>
<td>Moisture as packed (wt%)</td>
<td>5.0</td>
</tr>
<tr>
<td>Hardness (%), minimum</td>
<td>90</td>
</tr>
<tr>
<td>Bulk Density (G/L)</td>
<td>420-510</td>
</tr>
<tr>
<td>Mean Pellet Diameter</td>
<td>3.0</td>
</tr>
</tbody>
</table>

*A Material Safety Data Sheet (MSDS) and Technical Data Sheet must be submitted with the quote.*
c. Digester Gas Characteristics

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane</td>
<td>60-70% by volume</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>30-40% by volume</td>
</tr>
<tr>
<td>Temperature</td>
<td>average 80 deg Fahrenheit</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>40%</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>50 ppm average</td>
</tr>
<tr>
<td>Siloxanes Total</td>
<td>1.4 ppm (average)</td>
</tr>
<tr>
<td></td>
<td>2.0 ppm (maximum)</td>
</tr>
<tr>
<td>Siloxanes D4</td>
<td>0.3 ppm (average)</td>
</tr>
<tr>
<td></td>
<td>0.5 ppm (maximum)</td>
</tr>
<tr>
<td>Siloxanes D5</td>
<td>1.1 ppm (average)</td>
</tr>
</tbody>
</table>

Average gas flow through the treatment system is 500 cfm. At times the flow can be 750 cfm depending on the number of engines operating on digester gas.

It should be noted that the digester gas characteristics presented in this document are for informational purposes only. The Joint Meeting does not guarantee the gas composition will remain unchanged during the duration of this contract.

d. Experience Requirements

The prospective contractor must have at least five years experience in providing activated carbon for siloxane removal from digester gas. A list of at least three wastewater treatment facilities along with the contact name and phone number must be submitted with each quote.

e. Delivery

The material shall be delivered F.O.B. to the Joint Meeting Wastewater Treatment Facility in Elizabeth, New Jersey by flatbed trucks conforming to Department of Transportation requirements and all other applicable rules and laws. Contractor is responsible for clean up of any spills that may occur during the loading and transportation of material. The material shall be delivered within ten (10) calendar days of the time and date of order and the quantity delivered at any one time shall be in accordance with the Joint Meeting’s orders. Delivery hours are from 7:30 a.m. to 3:00 p.m. Monday through Friday. Material will be offloaded by Joint Meeting personnel.

f. Rejection on Testing

The Joint Meeting reserves the right to have any shipment of Siloxane
removal media inspected, tested, and analyzed either in its own laboratory, or by one or more competent independent laboratories. If any shipment of siloxane removal media is proven to be below the quality required by these specifications, the Joint Meeting reserves the right to reject that shipment. The rejected material shall be removed from the site by the Contractor and at the Contractor's expense. The Contractor shall then replace the entire shipment of rejected material with a full shipment of satisfactory material. The time allowed for replacement of the rejected material shall be no greater than five (5) calendar days.

In addition, should the siloxane removal media be rejected for reasons previously specified or should the Contractor fail to give adequate service in keeping the Joint Meeting properly supplied, the Joint Meeting reserves the right to purchase siloxane removal media from another supplier and the Contractor agrees to pay the difference between the amount paid for same and the amount calculated at the Contract Price. If the Joint Meeting purchases the siloxane removal media at a price below the Contract Price, the Contractor has no claim for a refund.

2. Spent Media Removal

   a. Prior to media removal, the vessel must be purge with one (1) Size 300 cylinder of nitrogen gas.

   b. The means and methods to remove the spent media from the vessel are the responsibility of the contractor. A vacuum truck can be used to pull the spent media from the bottom of the vessel through a hose. A dust filter should be used to control nuisance dust emissions in the area.

   c. The media removed from the vessel must be moved offsite for disposal or regeneration.

3. Spent Media Disposal

   a. **Contractor is responsible for the removal and disposal of the total quantity of spent media removed from the SAG vessel.** The means and methods to remove the spent media from the site are the responsibility of the contractor. Transportation of the spent media must be in sealed and covered containers, supersacks or vacuum truck. Compliance with DOT weight limits and other regulations is the responsibility of the contractor. The contractor is responsible for any spills that may occur during the transportation of the spent media. All spent SAG media must be removed from the plant site before final payment can be made to the contractor.

   b. The contractor shall file all necessary forms and meet all the requirements of the approved disposal facility. Contractor shall pay all fees related to the disposal
of the spent iron sponge media including but not limited to laboratory tests, application fees, review fees, fuel surcharges, and tipping fees. Copies of all documents related to the transportation and disposal of the media must be provided to the Joint Meeting before final payment can be made. Examples of documents to be provided include landfill approval documents, weigh tickets, manifests, etc. Final payment will not be made to the contractor until supporting documentation has been provided to the owner confirming that the spent media has been delivered to and accepted by a landfill approved to receive spent iron sponge media.

4. Loading New Media

a. The means and methods to load the new media into the vessel are the responsibility of the contractor.

b. The Joint Meeting will supply the portable blower with a small feed hopper to be used to pneumatically load the new media into the vessel. A dust filter should be used to control nuisance dust emissions in the area.

c. After the new media is loaded, the vessel must be purge with one (1) Size 300 cylinder of nitrogen gas.

5. Cleanup

The contractor shall remove all equipment, temporary work, trash, etc. from the work sites before final acceptance of the work. This includes removing all spent media from the lay down area. Clean up of the work areas must be completed to the satisfaction of the owner before final payment can be made to the contractor.

**Insurance Requirements:**

1. **Workers Compensation and Employer's Liability.**

The Contractor shall take out and maintain in force during the performance of the Contract and until the final completion thereof evidence of:

a. A policy of Worker's Compensation insurance in effect for all of the Contractor's employees, and, in case any work is sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation and Employer's Liability Insurance for all employees of the subcontractor unless such Insurance for all employees are covered by the protection afforded by the Contractor. The Workmen's Compensation and Employer's Liability Insurance shall be endorsed to provide coverage under all State and Federal statutes applicable to the scope of the Work.

b. The Contractor shall furnish proof of the existence of such insurance by Certificate
or otherwise as the Joint Meeting may require.

c. **Public Liability, Property and Automobile Insurance**

The Contractor will be required to take out and maintain during the life of the Contract at its own expense such Public Liability Insurance for Bodily Injury and Property Damage, and Automobile Insurance, as shall protect itself and the Joint Meeting its agents and employees from claims or damages for personal injury, wrongful death, as well as from claims for property damage which may arise from operations under the Contract, whether such operations by Contractor, or by anyone directly or indirectly employed by Contractor and the amount of such insurance shall be as follows:

d. **Public Liability, Property and Bodily Injury Insurance**

In an amount not less than ONE MILLION DOLLARS ($1,000,000.00) for injuries and property damage, including wrongful death to any one person, and subject to the same limit for each person, and an amount of not less than ONE MILLION DOLLARS ($1,000,000.00) on account of one accident. This insurance shall be written with a company acceptable to the Joint Meeting and authorized to do business in the State of New Jersey and shall be taken out before any operations of the Contractor are commenced, and shall be kept in effect until all operations shall be satisfactorily completed. Copies, or the originals, as the case may be, of such policies shall be furnished to the Joint Meeting indicating that the Joint Meeting of Essex and Union Counties is named as an additional insured.

e. **Automobile Insurance**

Public Liability Insurance and Property Damage Liability Insurance to cover each automobile, truck, vehicle or other equipment both owned and not owned used in the performance of the Contract in an amount not less than ONE MILLION DOLLARS ($1,000,000.00) on account of injury or death of any one person and subject to the same limit for each person, in the amount no less than ONE MILLION DOLLARS ($1,000,000.00) on account of one accident;

Prior to the commencement of any work by the Contractor there shall be filed with the Joint Meeting for approval, a copy of each and every insurance policy hereinabove required to be taken out and maintained in force showing the Joint Meeting of Essex and Union Counties as a named insured or in substitution thereof of a separate policy acceptable to the Joint Meeting and providing like coverage to the Joint Meeting.

Each and every insurance policy and/or certificate required by the terms of this Contract shall carry an endorsement to the effect that the Insurance Company will give at least THIRTY (30) days notice by registered mail to the Joint Meeting of any modifications or cancellations of any such policy or policies.

If, at any time, any of the said policies shall be or become unsatisfactory to the Joint Meeting as to form and substance, or if a company issuing any such policy shall be or
become unsatisfactory to the Joint Meeting, the Contractor shall promptly obtain a new policy and submit a copy of the same to the Joint Meeting for approval.

Property damage insurance shall include the legal liability of the Contractor for loss or damage to the property of the Joint Meeting. The insurance payable under this policy shall be applied by the insurance company first, to the protection of the Joint Meeting and the remainder, if any, to the other named insurers.

Failure by Contractor to keep all insurance as required herein in full force and effect during the term of this Contract shall be cause of the Joint Meeting to order the work stopped until premiums on such insurance policy have been paid or the Joint Meeting may pay the premiums due on such insurance policy and charge the same to the Contractor and deduct the same from any sums due the Contractor at the Joint Meeting's sole option.

In the event that claims in excess of these amounts are filed by reason of any operations under the Contract, the amount of excess of such claims, or any portion thereof, may be withheld from payments due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims as may be determined by the said Joint Meeting.