Golder Associates

February 23, 2010 083-89629

Mr. Al Linero
Program Administrator, Special Projects Section
Florida Department of Environmental Protection
2600 Blairstone Rd.
Tallahassee, FL 32399-2400

RE: REQUEST FOR ADDITIONAL INFORMATION
DEP FILE NUMBER: 1110138-001-AC
GEOPLASMA - ST. LUCIE, LLC FACILITY

Dear Mr. Linero:

Geoplasma - St. Lucie, LLC submitted an application to the Department for the above-referenced project on December 16, 2009. The application is to construct a waste-to-energy facility at the St. Lucie County Landfill that that will gasify and recover energy from municipal solid waste (MSW) using plasma arc technology to produce approximately 22 megawatts of electricity. Pursuant to Rule 62-4.055(1), Florida Administrative Code (F.A.C.), the Department has reviewed the application and by letter, dated January 16, 2010, has requested the following additional information. The Department's comments are addressed in the order in which they were received.

1. *Notice of Application: Please publish the attached notice in a newspaper of general circulation in the area of the project. Contact the undersigned for further details.*

Response: The notice of the Department's receipt of the air application was published on January 28, 2010. A copy of the affidavit is included as Attachment 1 to this letter.

2. *Applicable Regulations: Please advise whether Geoplasma has received guidance from the U.S. Environmental Protection Agency (EPA) regarding the applicability of 40 Code of Federal Regulations (CFR), Part 60, Subpart Eb – Standards of Performance for Large Municipal Waste Combustors (MWC). Otherwise provide the applicability rationale so that it can be forwarded to EPA Region for their review and input. The Department has already contacted EPA Region 4 to make them aware that such a determination request may be forthcoming. [40 CFR 60, Subpart Eb]*

Response: Subsequent to the Department's issuance of this RAI, there has been additional dialogue between the Department and the US EPA Region IV on this issue. In addition, in a meeting between Geoplasma and the Department on January 27, 2010, it was confirmed that both the Department and the EPA are in agreement that 40 Code of Federal Regulations (CFR), Part 60, Subpart Eb – Standards of Performance for Large Municipal Waste Combustors (MWC) does apply to this project.

3. *Case-by-Case Maximum Achievable Control Technology (MACT) Determination: According to the application, the facility will emit more than 10 tons per year (TPY) of hydrogen chloride (HCl) which is classified as a hazardous air pollutant (HAP). Therefore the facility will be a major source of HAP. If Subpart Eb does not apply, it will be necessary for Geoplasma to submit a case-by-case MACT proposal. It would be reasonable to develop MACT emission limits for the same pollutants governed by Subpart Eb. [Rule 62-204.800(11)(d)2., F.A.C.; 40 CFR 63, Subpart B].*

Golder Associates Inc.
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Tampa, FL 33609 USA
Tel: (813) 287-1717 Fax: (813) 287-1716 www.golder.com

Response: As was stated in the previous response, both the Department and the EPA are in agreement that 40 CFR, Part 60, Subpart Eb – Standards of Performance for Large Municipal Waste Combustors (MWC) applies to this project. Therefore, it will not be necessary for Geoplasma to submit a case-by-case MACT proposal.

4. *Process Rates: Please indicate which maximum process rates and averaging times are proposed for use with mass emission limits to limit the potential to emit (PTE). The possible parameters are heat input rate to the thermal oxidizer, MSW input or steam production. [Rules 62-4.070 (Reasonable Assurance) and 62-210.200 (Definitions – PTE), F.A.C.]*

Response: As was discussed during our meeting with the Department on January 27, 2010, the thermal oxidizer represents the most significant emission source of this overall project. Emissions from this unit are most directly related to the mass feed rate of MSW to the gasifier, which also is representative of the heat input rate to the thermal oxidizer (based on an assumed heating value for the product gas). Geoplasma proposes to monitor the heat input to the thermal oxidizer as a surrogate for operating capacity of the oxidizer. In addition, MSW feed rate to the gasifier can serve as a surrogate for whether the gasification process is operating at maximum capacity.

5. *Material Handling and Storage Best Management Practices (BMP) Plan: Please provide a BMP plan including a clearer description of the material handling and storage system (including pictures and diagrams) that supplement those already in place for the St. Lucie County MSW Landfill. Include descriptions of the storage pile management system and reasonable precautions to avoid fugitive emissions, odors and spontaneous combustion such as by minimizing drop distances, misting of material if needed, etc. Also indicate whether dust collectors will be utilized at the drop and transfer points of the fuel handling and storage system. [Rule 62-4.070, F.A.C. Reasonable Assurance]*

Response: A Plan has been developed for the project and is included as Attachment 2 to this submittal. This Plan presents the Best Management Practices (BMP) for the new facilities at the landfill site and includes changes expected to result from construction and operation of the plasma gasification WTE facility. Additional information concerning the changes in operation of the landfill facility will be included in the application for revisions to the Solid Waste Operating Permit for the combined facilities to be submitted by St. Lucie County. The Plan reflects our current understanding of the project and may be updated once design and construction have been completed in order to reflect actual operating conditions.

6. *Opportunity Waste Streams: What specific opportunity waste streams or categories of such streams other than the mentioned tires and sludge, are envisioned for the project. [Rule 62-4.070, F.A.C. Reasonable Assurance]*

Response: While other types of opportunity wastes are under further consideration for future use (e.g., biosolids and landfill gas), the air application is based on the current MSW that is received at the landfill site, as well as used tires. If the use of additional wastes is desired in the future, Geoplasma will submit an application for a permit revision.

7. *Ammonia (NH3) Slip: For the selective catalytic reduction (SCR) system used to control NOX emissions from the thermal oxidizer, provide the proposed NH3 slip rate in parts per million by volume, dry (ppmvd) corrected to 7 percent oxygen (O2)? [Rule 62-4.070, F.A.C. Reasonable Assurance]*

Response: Information received from Fuel Tech, the SCR system vendor, indicates that the NH_3 slip is estimated to be 2 parts per million by volume, dry (ppmvd) corrected to 7 percent oxygen (O_2).

8. *Mass Emissions Rates: Please provide the proposed averaging times for the concentration and mass-based emission rates for criteria pollutants and HAP. [Rules 62-4.070 and 62-210.200 (Definitions-PTE), F.A.C. Reasonable Assurance]*

Response: Included as Attachment 3 is a table summarizing averaging times and compliance measurement procedures for the Geoplasma project. The premise is that Subpart Eb applies and that, for the pollutants Eb requires to be monitored (i.e., NOx, CO, SO_2 and opacity), the format of the limit and associated averaging times are specified. For the pollutants not requiring the use of CEMS (i.e., VOC, PM_{10}, cadmium, lead, mercury, HCL and dioxins/furans), Geoplasma proposes to conduct an initial stack test under Florida rules.

9. *HCl Emissions: Please provide detailed calculations or vendor source data supporting the estimated HCl emission estimate. The HCl emission estimate appears somewhat high given the battery of pollution control equipment proposed including limestone-based-flue gas desulfurization (FGD) and activated carbon injection (ACI). [Rule 62-4.070, F.A.C. Reasonable Assurance]*

Response: The documentation for the derivation of the HCl emission estimates is provided in Attachment 4 to this submittal.

10. *Methods of Compliance for Emission Limits: Describe the compliance measurement procedures proposed for the project such as continuous emission monitoring systems (CEMS) and period stack testing. [Rule 62-4.070, F.A.C. Reasonable Assurance]*

Response: The pollutants to be continuously monitored (as required by NSPS Subpart Eb) and those proposed to be stack-tested were delineated in the response to question 8 above.

As these responses to the Department's requests for additional information reflect information of an engineering nature, new certification statements by the authorized representative and the professional engineer are also attached, per Rule 62-4.050(3), FAC.

If you should have any questions, please contact me at (813) 287-1717.

Sincerely,

GOLDER ASSOCIATES INC.

Scott Osbourn, P.E.
Project Manager

cc: Len Shapiro, Energy Resources Group, Inc.
Hillburn Hillestad, Geoplasma-St. Lucie, LLC

Attachments

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :**Hilburn Hillestad**

2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **Geoplasma- St. Lucie, LLC**
   Street Address: **171 17th St., NW, Suite 1550**
   City: **Atlanta** State: **GA** Zip Code: **30363**

3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(404) 353-0051** ext. Fax: **(770) 427-4228**

4. Owner/Authorized Representative E-mail Address: **Hillestad@geoplasma.com**

5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

H. Hillestad — Signature

22 feb 2010 — Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **Scott H. Osbourn**
   Registration Number: **57557**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **5100 West Lemon Street, Suite 114**
   City: **Tampa** State: **FL** Zip Code: **33609**
3. Professional Engineer Telephone Numbers...
   Telephone: **(813) 287-1717** ext.**53304** Fax: **(813) 287-1716**
4. Professional Engineer E-mail Address: **sosbourn@golder.com**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

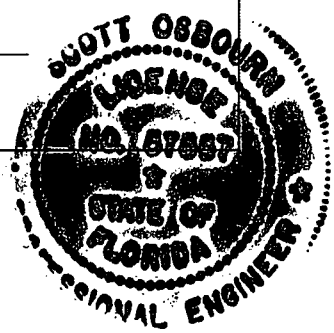
(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here , if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature 2/23/10 Date

(seal)



* Attach any exception to certification statement.

**** Board of Professional Engineers Certificate of Authorization #00001670**

ATTACHMENT 1

Notice of Receipt—Proof of Publication

Search Hits: 1 of 1

Publication: **NPT/Courier/Sun**
Publication Date: **January 28, 2010**
Agency:
Advertiser (#): **GEOPLASMA LLC (15617756)**
Description: **46/GEO**
Insertion Number:
Ad Number: **2364104**
Color, Ad Size: **B&W, 2 columns x 7 inches**
Sales Rep: **46**
Code: **Ind: 8743**
Edition: **St Lucie News Tribune**
Zone: **St Lucie News Tribune**
Section, Page: **Local (B), 12**

Find **All ads** on this page

Email this ad

B11 B12 B13

Woman accused of shoplifting with boy

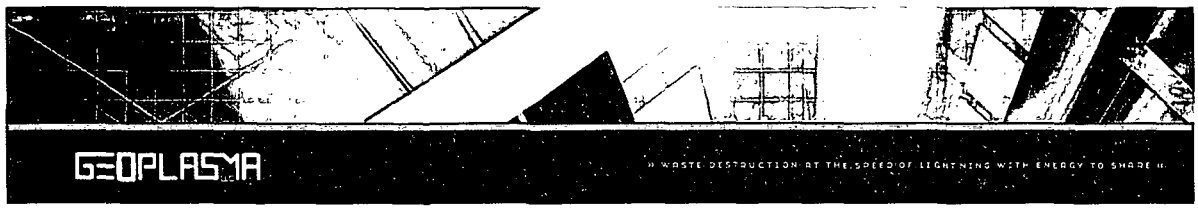
Negron defends bill for control of Children's Service Council

Police: Woman drove with other woman on hood

Man, 71, faces gun, assault charges

ATTACHMENT 2

Materials Handling & Storage BMP Plan



MATERIALS HANDLING AND STORAGE BEST MANAGEMENT PRACTICES (BMP) PLAN

For

Geoplasma-St. Lucie, LLC

Plasma Gasification Waste to Energy Facility

February 2010

6120 Glades Cut-off Road
Fort Pierce, Florida 34891

Contents

1 Background

Geoplasma-St. Lucie LLC (Geoplasma) proposes to design, construct, own and operate a waste-to-energy (WTE) facility for recovery of energy from municipal solid waste (MSW) utilizing plasma gasification technology. Geoplasma will own and operate the St. Lucie Plasma Gasification Facility under a long term contract with the government of St. Lucie County, Florida.

The proposed facility will have a nominal capacity of 600 tons per day (tpd) and will process all of the Class I MSW currently generated in St. Lucie County (approximately 525 tons per day) plus an additional 75 tons per day of waste tires, including both passenger vehicle, truck and heavy equipment tires. The facility is expected to produce a gross electrical output of approximately 22 megawatts (MW) of renewable energy on a continuous basis with availability in excess of 85 percent expected.

The proposed facility will be located on an approximately nine (9) acre parcel of in the southern portion of the approximately 330 acre site currently occupied by St. Lucie County's Sanitary Landfill (See Figure 1), located off of the Glades Cut-Off Road south of the crossing of Interstate 95 and the Florida Turnpike approximately 8 miles southwest of the City of Fort Pierce in St. Lucie County, Florida. The facility will include the existing baling and recycling operation (the blue building in the center of the Figure) and will be expanded to the west and south of this building as shown in Figure 2.

Figure 1. St. Lucie County Landfill Site

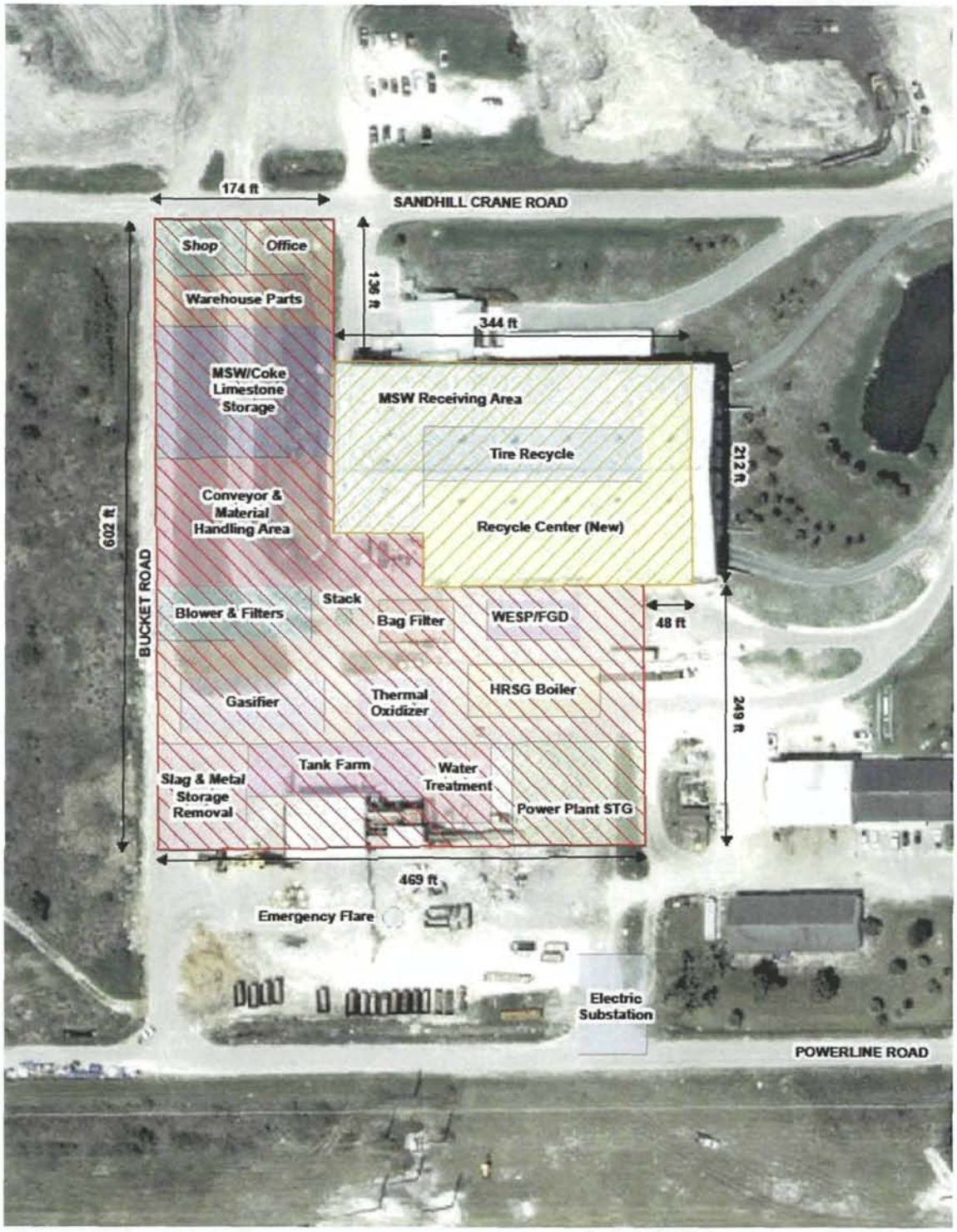


Figure 2. Proposed Geoplasma-St. Lucie Gasification Plant Layout

The project will be accessed through the existing landfill access roadway. The County will continue to operate the receiving and weighing facilities for all wastes. It will also continue to operate the existing

facilities for receiving and transfer of recyclable items (batteries and fluorescent tubes) and household hazardous waste and receiving and disposal of construction and demolition (C&D) and vegetative wastes. The operation of the sanitary landfill will be significantly reduced, but the facility will remain available for disposal of MSW during periods when the gasification facility is not in operation due to scheduled maintenance.

This Plan presents the Best Management Practices (BMP) for the new facilities at the landfill site and includes changes expected to result from construction and operation of the plasma gasification WTE facility. Additional information concerning the changes in operation of the landfill facility will be included in the application for revisions to the Solid Waste Operating Permit for the combined facilities to be submitted by St. Lucie County.

The most significant changes resulting from the availability of this facility will be the discontinuation of the baling of Class I MSW going to the landfill and the significant (greater than 85 percent) reduction in the quantity of MSW going to the landfill. From an external viewpoint, with the exception of the construction of the plasma gasifier and electrical generating structures and supporting facilities, there will be little apparent change in the overall landfill operation. The County will continue to operate the scale house and initial inspection facilities as well as the construction and demolition (C&D) and vegetative wastes management facilities and Class I MSW will continue to be delivered to the existing building that currently houses the tipping floor and baling and recycling operations.

2 Waste Receiving, Inspection, Weighing, and Fee Collection

As noted above, the County will continue to operate the scalehouse and will maintain responsibility for initial inspection of delivered waste to preclude unacceptable materials, weighing and collection of fees for the disposal of all types of wastes. Disposal fees for all types of waste accepted at the landfill or gasification facility will continue to be based on weight and material type with fee schedules posted at the scalehouse and at the entrance gate to the facility. Waste materials received at the site are classified by code for identification, routing for disposal, and billing purposes and County personnel will continue to perform these activities. Incoming vehicles carrying Class I MSW will be directed to the Geoplasma receiving facilities in the existing building and there will be no change in the routing of these vehicles.

Vehicles will continue to be weighed on the entrance scales as they are checked in at the scalehouse. After unloading their refuse, the vehicles are weighed on the exit scales and assessed fees based on tonnage or load, and type of waste unloaded. Scalehouse personnel maintain daily records of number and type of vehicles, load sizes, fees assessed and type of material being disposed. Scalehouse personnel will also assume responsibility for weighing vehicles transporting recycled materials and salable vitrified residue from the Geoplasma facility and will compute the processing fee to be paid to Geoplasma for the waste processed.

3 Traffic Control and Routing

The traffic patterns within the existing landfill facility have been set to facilitate a continuous traffic flow of vehicles entering the site, maneuvering in and around the existing Baling Facility or the C&D operating face and exiting the site. These general flow patterns are expected to be maintained following construction of the plasma gasification facility with incoming MSW continuing to be delivered to the existing building. The only anticipated significant change in vehicular traffic is reduction in traffic between the existing Baling Facility and the active face of the landfill.

Access to the site and the Geoplasma facility will continue to be controlled at the scalehouse located at the southeast corner of the site. The scalehouse, with its attendants, signs and designated traffic lanes, will provide control for all traffic entering and leaving the landfill area. Vehicles entering the landfill will be routed over the incoming scale on the east side of the scalehouse and directed by signs to stop for weigh-in and fee payment.

The scale operator will direct the hauler to the proper disposal area (Geoplasma facility, C&D disposal area, or vegetative waste area) based upon its material identification code. Traffic will follow the posted signs directing them to the disposal area. Diversion of entering traffic to the access roads will be accomplished by placement of barriers and signs on the closed access road and placement of signs directing traffic on the open access road. Additional direction signs will be placed as necessary at the end of the access road when the unloading zone is not visible from that point.

Only loads containing 100% construction and demolition debris will be sent to the Construction and Demolition (C&D) cell located along the southern property boundary. If a load contains any Class I waste, even if the majority of it contains construction and demolition debris, the scale operator and spotters will direct the hauler to unload in the Geoplasma waste receiving area located in the existing baling and recycling building. Geoplasma personnel will direct unloading of vehicles at the Geoplasma receiving facility and County personnel will direct unloading at the working face of the active C&D cell.

If a hauler dumps Class I waste at the C&D cell working face, County site personnel (spotter) will direct the hauler to pick up the Class I material, reload the vehicle and transport the waste to the Geoplasma receiving facility. All vehicles leaving the site are required to stop at the scalehouse and be weighed for fee assessment.

Haulers of waste tires will check in and out at the scalehouse in the same manner as other site traffic. Signs will direct tire haulers to the tire unloading area to be relocated to the Geoplasma waste receiving facility.

4 Exclusion of Unacceptable Wastes

County personnel will continue to maintain primary responsibility for exclusion of unacceptable wastes from the site through continued implementation of the following measures:

- Posting of sign(s) at the site entrance designating types of waste not acceptable for disposal.
- Inspection by scalehouse personnel of vehicles whose appearance suggests that they may contain unacceptable wastes (tank trucks, vehicles containing drums, tanks, suspicious containers, etc.) or

vehicles transporting items listed as unacceptable. Vehicles found to contain unacceptable wastes will not be permitted to enter the site.

Wastes not accepted at the site will continue to include:

- Hazardous or poisonous materials
- Waste fuel, oil, solvents or other flammable materials
- Radioactive materials
- Infectious wastes
- Free liquid

The County will also continue the voluntary recycling facilities for household hazardous waste, electronics, batteries, white metal, fluorescent light bulbs and other materials not suitable for landfill disposal or plasma gasification.

5 MSW Handling and Storage Procedures

Class I MSW for processing by plasma gasification will be continue to be delivered to the landfill site six (6) days per week during a period of approximately ten (10) hours on weekdays and eight (8) hours on Saturdays with no waste delivered on Sunday. Waste will be delivered to the Geoplasma receiving facility (to be located in the existing Baling and Recycling Facility building) using the current vehicle entry and exit routes. Geoplasma personnel will assume responsibility for the waste once it has been deposited on the tipping floor in the receiving facility (Figure 3).

Figure 3. Tipping Floor of Baling and Recycling Facility

To permit continuous 24-hour operation of the plasma gasification facility, waste will be accumulated for processing during the remainder of the day. In addition, waste to be processed on Sundays and holidays when waste is not received will also be stored to provide fuel for operation on these days. It is anticipated that storage for approximately 3+ days of material (1800 tons of MSW and 300 tons of tires) will be required.

It is anticipated that the existing baling and recycling facility will be utilized as the receiving facility for wastes to be processed by plasma gasification and that the required area for processing and storage of daily waste deliveries can be accommodated within the existing structure. It is anticipated that storage for additional waste required for processing during periods when waste is not being delivered will be provided by an addition on the west side of the existing structure using similar construction.

Currently, two conveyors in the tipping floor are used to transfer waste from the tipping floor to two

balers located at the west end of the existing building (See Figure 4 and Figure 5.)

Figure 4. Existing Conveyors on Baling and Receiving Building Tipping Floor

It is anticipated that the balers will be replaced by shredders capable of reducing the size of the MSW to less than six (6) inches in maximum dimension.

As a minimum, dust generation will continue to be minimized through implementation of the following measures currently employed in the existing operations:

- Paving vehicle traffic areas
- Posting signage regarding requirements for covering (tarping) of loads until inspection
- Providing verbal commands at the weigh station
- Applying water inside the building to off-loaded materials
- Transferring MSW material indoors only

- As required, wetting paved surfaces to further mitigate the potential for dust generating conditions.
- Facility personnel will have the ability to meter the amount of water and odor counteractant that is utilized to control dust and odors. Only the necessary amount of water and nozzles will be utilized so that the facility will not create wastewater/leachate or have higher disposal costs due to the addition of water weight to the waste materials. The system will be equipped with pumps to drive the atomization of the water to the appropriate droplet size. It is anticipated that approximately 1,500 gallons per day of water will be required for this misting system.

Figure 5. Existing Balers in Baling and Receiving Building

A simplified block flow diagram illustrating the material handling processes is provided in Figure 6. More detailed information on each of these operations is provided in the following sections.

5.1 Waste Inspection and Initial Processing

Waste delivered to the tipping floor area will be inspected, recyclable materials or unacceptable items removed, and the remainder processed for input to the plasma gasification process. It is anticipated that a new Materials Recovery Facility (MRF) will be constructed within or adjacent to the existing Baling and Recycling Facility (see Figure 2) and this facility will be utilized to process recyclable materials recovered during the initial processing of incoming waste as well as additional materials recovered following size reduction. Materials that are unacceptable (such as hazardous or medical wastes) or undesirable (such as inert construction and demolition wastes) for plasma processing will be

segregated from the incoming waste stream and disposed of in accordance with applicable requirements.

Depending on delivery rates and operational requirements, incoming waste may be: (1)processed immediately for size reduction to 6" minus size and recovery of additional recyclable materials (primarily ferrous and non-ferrous metals) and immediate input to the gasification process; (2) processed for size reduction and recovery of recyclable materials and stored for later input to the gasifier, or (3)accumulated as received for later size reduction, recyclable material recovery and gasification.

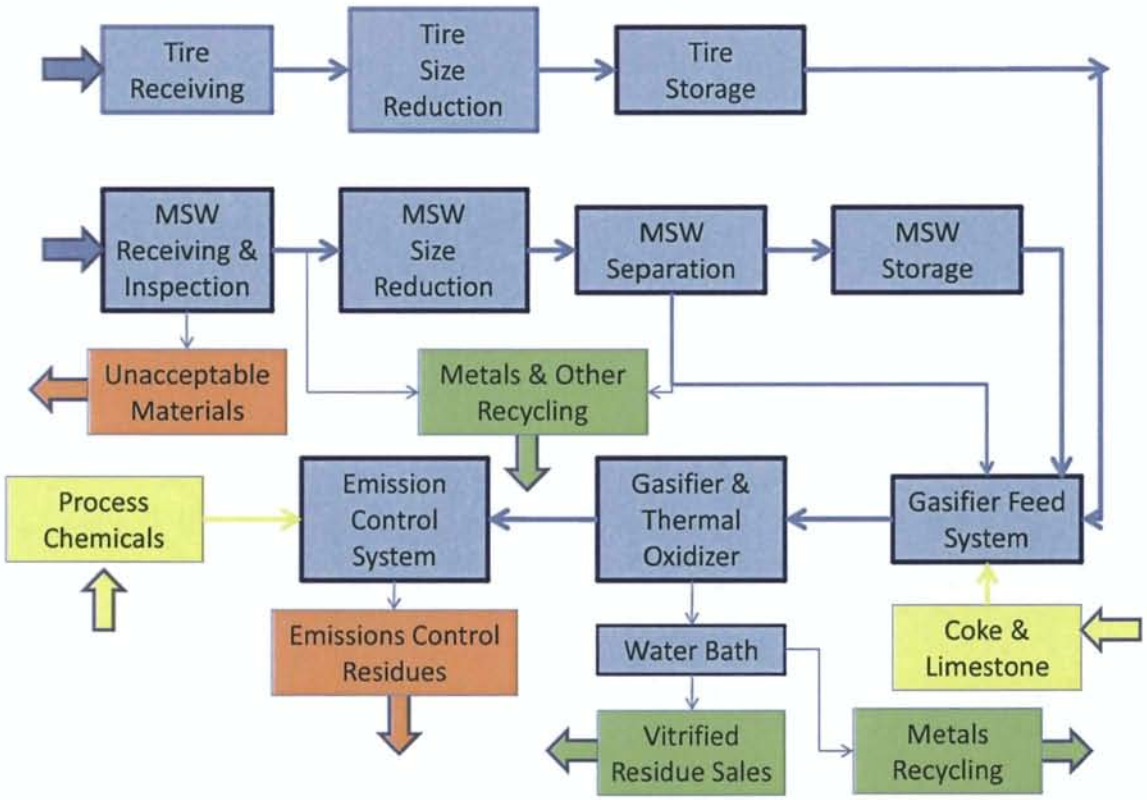


Figure 6. Simplified Materials Handling Block Flow Diagram

5.2 MSW Size Reduction and Recyclable Material Separation

Size reduction will be accomplished through the use of low speed shredders with a combined capacity in excess of 600 tons/day and capable of reducing the anticipated input materials to a maximum size of approximately 6 inches. Hydraulic shears or other equipment may be used to reduce the size of large items such as carpeting, furniture and mattresses, creosoted poles and timbers, and agricultural tarps and plastic sheeting as necessary to permit feeding into the shredders. Following size reduction, the

MSW feedstock will be further processed to recover recyclable metals using magnetic and/or eddy current separation techniques.

After the separation process, the output from the shredders will be directed to a radial conveyor system that can deliver the output either directly to the gasifier input conveyor system or to transfer areas for movement to the storage area. Front end loaders will be used to move the waste materials within the building for size reduction, storage and recovery for processing. A covered conveyor system will be utilized to move waste from the receiving/storage area to the gasifier input.

5.3 Gasifier Feed System

As noted above, depending on delivery volumes and system operations, MSW delivered to the facility may be processed immediately, processed for size reduction and stored for later processing, or stored for later size reduction and processing. Material to be processed immediately will be moved to the shredder inputs by rubber tired front end loaders and then conveyed to the gasifier feed system conveyor input by a radial conveyor system. The potential for fugitive emissions from the transfer from the radial conveyor to the gasifier feed system conveyor will reduced by minimizing the drop distance from the radial conveyor to the feed system input hopper and any emissions that may occur will be controlled by locating one or more gasifier system air intakes in close proximity to the transfer point with provisions for mechanical separation of particulates in the intake system as required to prevent deposition of dust in the ductwork. Wastes recovered from storage will be conveyed to the gasifier feed system conveyor by front end loaders which will deposit the shredded waste in the input system hopper. The potential for fugitive emissions from this transfer operation will be reduced by minimizing the drop distances from the front end loader bucket to the feed hopper and any emissions that do occur will be captured by the gasifier air intake system.

Metallurgical coke and limestone used as a flux in the gasification process will be transferred to the gasifier feed system via screw conveyors and shredded tires will be mixed with the waste input streams at the input to the gasifier feed conveyor system. Potential for emissions from these operations will be reduced by minimizing drop distances in these operations and emissions that may occur will be captured and controlled by the gasifier air intake system.

5.4 MSW Storage and Handling

To minimize the potential for odors and fugitive emissions, the air for the gasifier and thermal oxidizer will be drawn through the receiving and storage facility when the plant is in operation. If the gasifier is down, air would be exhausted through a carbon filter to reduce odors and control fugitive emissions.

It is anticipated that any liquid draining from the waste in the storage and handling facility will be collected and that quantities will be small and can be disposed of in the gasifier. An alternative disposal method is to use the existing landfill leachate treatment and discharge system; however, use of this alternative is not expected to be required under normal operating conditions.

The following sections provide an overview of the air equipment and operating procedures that will be implemented in the Geoplasma Receiving and Storage Facility to minimize the potential for nuisance dust and odor. These measures include conducting all waste handling operations in enclosed buildings,

maintaining the size reduction, MSW storage area and gasifier feed system areas under negative pressure, provision of supplementary engineered controls as necessary, implementation of good management practices for the waste, and utilization of an odor control misting system as required to assure that any dust or odor generated within the buildings will be adequately controlled and emissions to the atmosphere minimized.

5.4.1 Ventilation and Engineered Controls

The primary method for minimizing air emissions associated with MSW storage and handling operations will be to conduct all MSW handling within enclosed structures (the existing Baling and Recycling Building and any additional processing or storage areas.) In addition, the size reduction area, additional MSW storage area, and gasifier feed system areas will be maintained under a slight negative pressure by drawing air required for the gasification and thermal oxidation processes through the structure. Maintaining these areas under negative pressure will minimize the potential for the escape of odors or fugitive emissions to the atmosphere. To maximize the control of potential emissions, intake points for the air supply will be located close to the points with the greatest potential for generation of fugitive emissions such as the shredder outputs and input point to the gasifier feed system. If necessary, the air intake points may be provided with supplemental mechanical particulate removal/control equipment such as cyclones or filters to minimize deposition in the air supply ductwork.

To further minimize potential for dust generation, transfer points in conveyor systems will be designed to minimize drop heights and the height of the discharge points of the radial conveyors on the shredders will be adjustable to minimize drop distances when waste is being delivered to transfer points for movement by front end loaders.

If appropriate, dust and odor will be controlled in the additional MSW storage areas using misting devices that spray a fine atomized mist of water and odor counteractant product on the MSW, and into the indoor atmosphere. These materials are non-hazardous and the fragrances that are added to the counteractant are typically essential oils. This system has proved effective in minimizing dust generation associated with similar operations in other facilities.

Engineered dust control systems and operational procedures will continue to be supplemented by vacuuming or sweeping of the tipping floor, size reduction area and the transfer and MSW storage areas as necessary.

5.4.2 Operational Controls

Engineering controls will be supplemented by operational procedures designed to minimize the potential for creation of fugitive emissions and dust. The most important operational control will be the management of the waste storage areas on a "first-in, first-out" basis to minimize the time that waste is stored and the potential for generation of odors and dust as well as the potential for spontaneous combustion. As currently planned, waste will be stored in a linear fashion with fresh waste added to the storage area in a sequential manner and the oldest waste removed to minimize storage duration. These procedures will also control insects and rodents by interrupting insect breeding cycles and depriving rodents of refuge sites.

The existing building is equipped with fire suppression equipment with automatic notification features and similar equipment and systems will be provided in any new storage or handling areas.

5.4.3 Training

Personnel will be trained to minimize drop heights to reduce the potential for creation of fugitive emissions when moving wastes with front end loaders.

The facility will implement an operations and maintenance and environmental monitoring program that will consist of strict protocols for the identification, inspection and rejection of hazardous waste and other unacceptable materials. The facility will have a minimum of two on-site individuals that have received proper training to identify and handle hazardous materials. The facility will ensure that the personnel maintain their training and continue to undergo annual refresher training.

Operators/spotters will direct hazardous waste discovered in the waste stream for proper disposal as required by FAC 62-701 and other applicable regulations.

All operations staff, including drivers, will also attend a "Hazard Communication" class so that they can help facilitate requirements of the plan and satisfy the OSHA Hazard Communication Standard. Also, all on-site personnel will be properly trained with respect to other operation and maintenance protocols, which includes the identification of nuisance conditions that could impact air quality (odor).

5.4.4 Facility Inspection

Facility personnel will inspect and document proper facility operations on a daily basis. If an area requires corrective action, that action will be instituted immediately.

5.4.5 Periodic Maintenance

All on-site equipment and engineering controls will be maintained following manufacturer specifications and/or at intervals that ensure their integrity.

5.4.6 Pollution Control Equipment on Vehicles & Equipment

It is anticipated that new mobile equipment will need to be purchased for utilization at the gasification facility. The new equipment will meet or exceed current federal regulatory standards for vehicle emissions.

All non-mobile equipment (shredders, conveyors and dust control systems) will be electrically powered. There will be no particulate matter emissions from the motors of the electrically powered equipment.

The facility will continue to use low sulfur diesel fuel in on-site mobile equipment to reduce emissions of oxides of sulfur (SOx).

5.4.7 Doors

Overhead, roll-up type garage doors will continue to be used in the openings of the building for access and egress. If appropriate, an odor control system will be installed around the perimeter framing the doorways. The odor control system will create an "odor curtain" that will prevent potential odors from emanating out of the building. In addition, "freezer strip" type hanging plastic strips that drape down from the top of the door frames to approximately 12 feet above the ground may be installed on the

access doorways. The strips serve to limit sound and dust from migrating outdoors but still allow for larger trucks to enter the building unimpeded.

5.4.8 Fire Protection

In addition to controlling fugitive dust and odors, misting of the waste materials with odor counteractant or water and minimization of drop distances in transfer operations will minimize the potential for accidental ignition of the waste and management of the stored material to assure "first-in, first-out" processing will minimize potential for spontaneous combustion of the waste.

The St. Lucie County Fire Department currently provides fire protection services for the landfill and will continue to provide services for the Geoplasma facility. The existing Baling and Recycling Facility is provided with a sprinkler system for fire suppression and this system will be maintained and expanded as appropriate to reflect the increased quantity of waste that may be present. Additional fire hydrants and fire nozzles will be provided throughout the gasification facility. All additional structures and process equipment will be designed in accordance with applicable building codes and recommended fire protection practices.

6 Management of Plasma Gasification Process Chemicals and Residuals

Implementation of the plasma gasification process will require the receipt, storage and handling of chemicals used in the gasification process and emission control systems and the collection, storage and handling of process residuals for reprocessing or offsite shipment. Chemicals used in the gasification process include crushed limestone used as flux in the gasification process to improve the fluidity of the vitrified residue and metallurgical coke is added to provide a porous bed and heat reservoir at the bottom of the gasifier vessel. Chemicals used in the emission control system include powdered limestone used in the flue gas desulfurization system; powdered activated carbon (PAC) added to the particulate control system to capture mercury and complex organics; and urea used as source of ammonia in the Selective Catalytic Reduction (SCR) system for control of nitrogen oxide emissions. Process residuals include the vitrified residue and recyclable metals from the gasifier; ash from the electrostatic precipitator in the particulate emission control system; a mixture of fine ash and powdered activated carbon from the fabric filter in the emission control system; and a mixture of calcium carbonate and calcium sulfate produced by the flue gas desulfurization system. Procedures and equipment for storage and handling of these materials are described in the following sections.

6.1 Gasification Process Materials

The crushed limestone and metallurgical coke used in the gasification process will be delivered by truck and transferred pneumatically or by screw conveyors to storage silos located in the vicinity of the MSW receiving and processing areas. The unloading area and facilities for transfer to the storage silos will be provided with dust control and fabric filter emission control systems that will operated whenever receiving operations are in progress. From the storage silos, the coke and limestone will be transferred by screw conveyors to the point of mixing with the gasifier feed. At the point of mixing with the gasifier, dust collection will be provided by the air intake for the gasification process supplemented as

necessary by mechanical separation to minimize settling in the air intake system. Water misting may also be provided as a supplementary control measure.

6.2 Emission Control System Process Materials

The powdered limestone and powdered activated carbon will also be delivered by truck and transferred pneumatically to storage silos located in the vicinity of the emission control system. As with the gasifier process materials, the unloading and transfer systems will be provided with dust control and fabric filter emission control systems that will operate whenever receiving and transfer operations are underway. From the storage silos, the limestone and PAC will be transferred by screw conveyors to the points of injection into the emission control system. Potential emissions from these transfer operations will be controlled by the process emission control system.

Urea will be received, stored and transferred to the emission control system as a liquid and no fugitive emission controls are expected to be required.

6.3 Gasifier Process Residuals

The residue from the gasification process is discharged from the bottom of the gasifier vessel as a two phase liquid stream consisting of the molten, glass-like vitrified residue that includes the inorganic, non-metallic materials present in the MSW and a molten metal stream that includes metals present in the MSW not removed in the initial recycling or process steps. These materials are discharged into a water bath and the creation and sudden collapse of steam bubbles produced by the heat from the molten material causes the vitrified residue to break up into a coarse black sand-like material suitable for use as aggregate in concrete or asphalt products and the metals to form small nodules that are expected to have an iron content high enough to permit them to be easily magnetically separated from the vitrified residue for recycling. After separation, these materials will be transferred to storage silos via screw conveyors. Both the vitrified residue and residual metals are expected to be salable and will be transferred by gravity or screw conveyor to trucks for shipment offsite. Because these materials will be handled wet, dust collection and control equipment is not expected to be necessary at the transfer points; however, it may be provided if it is decided to handle these materials dry or if operating experience indicates the need for control.

6.4 Emission Control System Residuals

An electrostatic precipitator will be the first control device in the emission control system for the exhaust gases from the thermal oxidizer. Ash from the precipitator will be transferred pneumatically to a storage silo located in the vicinity of the emission control system. To the maximum extent practicable, ash collected in this system will be returned pneumatically to the gasifier feed system for reprocessing and incorporation into the vitrified residue. Material to be returned to the gasifier will be transferred pneumatically; material requiring off-site disposal will be transferred to the truck loading facility via screw conveyor with dust control provided by wetting the ash during transfer and loading.

The mixture of fine ash and activated carbon from the fabric filter (baghouse) system used for control of mercury and complex organic emissions will be pneumatically transferred to storage silos in the vicinity of the emission control system and from the silos to truck by systems provided with fabric filter

based emission control systems that will operate whenever transfer operations take place. This residual material is expected to be picked up by a vendor for offsite processing to recover mercury, destroy adsorbed organic material and disposal or recycling of the residual materials.

It has not yet been determined whether the flue gas desulfurization system will be wet or dry. If the system is dry, however, it is anticipated that the residual mixture of calcium carbonate (limestone) and calcium sulfate and calcium chloride produced by the removal of acid gases (SOx and HCl) will be transferred by screw conveyors to storage silos in the vicinity of the emission control system. Material will be transferred from the silos to truck loading facilities via screw conveyors. The silos and truck loading facilities will be provided with dust collection and fabric filter based emission control systems that will operate whenever transfer operations take place.

No residues are expected to be produced by the liquid urea based selective catalytic reduction systems to be provided for control of emissions of oxides of nitrogen and no requirements for emission controls on the liquid handling systems are anticipated.

ATTACHMENT 3

Pollutant Averaging Times and Compliance Methods

Attachment 3 - Averaging Times and Compliance Demonstration Methods

19-Jan-10

Pollutant	Basis	Method	Frequency	Averaging Time/Method	Special Requirements
SO2	Subpart Eb 40 CFR 60.58b(e)	CEMS	Continuous	24-hr geometric mean	Measure percent reduction as well as stack outlet value
PM*	Subpart Eb 40 CFR 60.58b(c)	Stack Test Method 5 filterable	Annual**	Three test runs (duration of runs not specified in Subpart Eb)	1.7 m3 minimum sample volume, gas temp. no greater than 160oC in sample train
Opacity	Subpart Eb 40 CFR 60.58b(c)	COMS	Continuous	6-minute average	
Opacity	Subpart Eb 40 CFR 60.58b(c)	Stack Test Method 9	Annual**	Three test runs (duration of runs not specified in Subpart Eb)	
Cadmium*	Subpart Eb 40 CFR 60.58b(d)	Stack Test Method 29	Annual**	Three test runs (duration of runs not specified in Subpart Eb)	1.7 m3 minimum sample volume
Lead*	Subpart Eb 40 CFR 60.58b(d)	Stack Test Method 29	Annual**	Three test runs (duration of runs not specified in Subpart Eb)	1.7 m3 minimum sample volume
Mercury*	Subpart Eb 40 CFR 60.58b(d)	Stack Test Method 29	Annual**	Three test runs (duration of runs not specified in Subpart Eb)	Continuous parameter monitoring required for mercury injection system with limits on carbon injection system mass feed rate to be established at the time of testing
HCl*	Subpart Eb 40 CFR 60.58b(f)	Stack Test Method 26	Annual**	Three test runs (minimum 1 hour sampling time each run)	
Dioxin/Furan*	Subpart Eb 40 CFR 60.58b(g)	Stack Test Method 23 total mass	Annual**	Three test runs (minimum 4 hour sampling time each run)	Limits on operating parameters*** must be established at the time of testing
NOx	Subpart Eb 40 CFR 60.58b(h)	CEMS	Continuous	24-hr arithmetic mean	
CO	Subpart Eb 40 CFR 60.58b(i)	CEMS	Continuous	4-hr block arithemetic average	
VOC		Stack Test	Initial	Three 1-hour test runs	
PM_{10}		Stack Test	Initial	Three 1-hour test runs	

* Alternatively the applicant may opt to install CEMS.

** No less than 9 months and no greater than 15 months following the previous performance test with 5 tests per 5 calendar year period.

*** Operating parameters are carbon injection system mass feed rate, maximum particulate matter control device temperature, maximum MWC combustor load based on steam flow or boiler feedwater flow.

ATTACHMENT 4

Documentation of HCL Emission Estimates

HCL EMISSION ESTIMATE DOCUMENTATION
Project: St. Lucie Plasma Gasification

Parameters		HCL Emission Estimates
Chlorine in waste:	0.65 %	Table 3-1 (truncated to 0.6% in table)
Feedstock flow rate:	51,998 lb/hr	Table 3-1
Chlorine mass rate:	337.99 lb/hr	= (0.65%) x (51,998 lb feedstock/hr)
Uncontrolled HCl mass rate:	347.60 lb/hr	= (337.99 lb Cl/hr) x (36.46097 lb HCl/lbmol HCl) x (1 lbmol HCl/lbmol Cl) / (35.453 lb Cl/lbmol Cl)
Uncontrolled HCl mass rate:	1,522 TPY	= (347.60 lb HCl/hr) x (8,760 hr/yr) / (2,000 lb/ton)
Controlled HCl mass rate:	16 TPY	Table 3-3
Scrubber Control Efficiency:	98.95%	= (1,522 TPY - 16 TPY) / (1,522 TPY) x 100

Golder Assumptions

36.46097 lb/lbmol, Molecular weight of HCl
35.453 lb/lbmol, Molecular weight of Cl
2,000 pounds per US short ton (lb/ton)
8,760 operating hours per year (hr/yr) for permitting purposes