FULCRUM SIERRA BIOFUELS, LLC

EXECUTIVE SUMMARY

Fulcrum Sierra BioFuels, LLC ("***Sierra BioFuels***") is developing a municipal solid waste ("***MSW***")-to-ethanol production facility in McCarran, Nevada (the "***Facility***"). Sierra BioFuels' process converts organic waste materials to ethanol, utilizing new technologies in an innovative, clean, and efficient, two-step thermochemical process. In the first step, cellulosic and other organic materials recovered from MSW, after recycling ("***Feedstock***"), are gasified in a down-draft, partial oxidation gasifier followed by a plasma arc. This equipment provides a highly efficient method of creating a synthesis gas, which consists mainly of hydrogen, carbon monoxide, and carbon dioxide. In the second step, the synthesis gas is catalytically converted to ethanol through a process developed by Fulcrum BioEnergy, Inc., using a new, proprietary catalyst technology.

Pursuant to Nevada Administrative Code 444.676, Sierra BioFuels has submitted an application to the Nevada Division of Environmental Protection, Bureau of Waste Management ("***NDEP***"), Solid Waste Branch requesting approval of the Facility's location and its design and operating plans prior to placing the Facility into operation.

Site Location

The Facility is located on a 16.77 acre parcel (the "***Site***") in the Tahoe-Reno Industrial Center (the "***TRIC***"). The TRIC currently consists of approximately 6,000 acres zoned "I-2 Heavy Industrial" under the Storey County zoning ordinance, which allows for the development of the Facility with approval of only a special use permit. A Site Plan and Site Location Map showing a radius of the land use zoning are provided in **Exhibit ES-1** and **Exhibit ES-2**, respectively.

Plant Operational Areas

The Facility has two operational areas, Plant Area A and Plant Area B. Plant Area A consists of the activities associated with the first step of the process, mainly the delivery, processing, storage and handling of Feedstock to the outlet of each gasifier and plasma arc system of the Facility's two synthesis gas generation units, including the residual materials produced in Plant Area A. Plant Area B consists of all other activities associated with the second step of Sierra BioFuels' process, including the products produced (e.g. ethanol), materials and supplies purchased for use at the Facility, and any industrial waste generated.

Facility Description

The following is a description of each of the major processes as the Feedstock and resulting synthesis gas is processed at the Facility, including design capacities and environmental controls. A general Site Plan is provided in **Exhibit ES-1**.

Plant Area A

Plant Area A consists of the activities associated with the first step of the process, mainly the delivery, processing, storage, and handling of Feedstock to the outlet of each gasifier and plasma arc system of the Facility's two synthesis gas generation units, including the residual materials produced in Plant Area A. A block flow process diagram for Plant Area A is provided in **Exhibit ES-3**.

Feedstock Delivery

The Feedstock will be comprised of the organic component of MSW and/or construction and demolition waste streams derived from the residual materials remaining after recycling operations are performed by material recovery facilities ("***MRFs***"). The Facility will be open to accept Feedstock deliveries 24 hours per day, seven days per week, resulting in approximately 10 to 15 Feedstock truck deliveries per day. The Feedstock will be transported to the Site by tipper-style fixed floor transfer trailers or construction-style roll-off trailers. The Facility will receive approximately 250 – 450 tons per day ("***TPD***") of Feedstock depending on the hours of operation of the MRFs. However, depending on permit limitations on a particular MRF's hours of operation, deliveries may be scheduled for five days per week, resulting in approximately 20 to 25 loads per day. All trucks will be required to have the loads covered to prevent blowing or spillage during transport. Upon arrival at the Facility, all loads of Feedstock will be weighed prior to unloading using a drive-on, drive-off truck scale located near the main entrance gate. The weight output will feed to the gate attendant.

Unloading of Feedstock in unauthorized areas will be prohibited. Pursuant to the Facility's Site Operation Plan, Sierra BioFuels' operations personnel will monitor all incoming loads of Feedstock for prohibited materials and direct deliveries to the appropriate unloading area. Tipper type transfer trailers accessing the Feedstock process building tipping floor will back up to the Feedstock processing building via the access tipper ramp. Construction roll-off and flatbed type trailers can also directly access the tipping floor for offloading.

Feedstock Processing and Storage

A presort will be performed as the Feedstock is unloaded on the tipping floor to remove materials that are too large or to difficult to resize. A mobile front-end loader with a grapple device will remove the object(s) and place it in a reject dumpster for return to the landfill. The loader will also remove any large objects identified in the incoming material stream being pushed onto the walking floor feed conveyor. These objects will be placed in the rejects dumpster for return to the landfill. An eddy current and magnetic separator will remove non-ferrous and ferrous metals, respectively, for recycling.

The Feedstock will then be shredded to a size reduced form (approximately four inches and smaller) in an enclosed materials processing building which can hold one day of preprocessed Feedstock. Sized Feedstock is then stored at the Site for up to four days in an

enclosed Feedstock storage building. Both the Feedstock processing and storage buildings are equipped with mist odor environmental control equipment. Within the storage building, the Feedstock is moved to the Feedstock Handling System where it is fed into the gasification process for conversion to synthesis gas.

Feedstock Processing Dust Control

Dust will be minimized and housekeeping reduced in the Feedstock preparation building by the placement of a Feedstock processing dust suppression system with dust extraction pick-up at the Feedstock shredder/hammer mill and discharge belt conveyor material transfer points. The dust captured through this dust suppression system will be transported by the screw conveyor and discharged back onto a belt conveyor for transport to the Feedstock storage pile with the processed Feedstock.

Odor Control

The Facility will control odors so that there are no obnoxious odors causing a nuisance to adjacent properties. The Feedstock processing building and Feedstock storage building will be equipped with mist odor control systems on the ceilings throughout the buildings and at ingress and egress points and have the capability to adjust the type of neutralizing additive used in the system based on actual conditions and constituents that may be causing odors. Mist odor control systems provide one of the most effective methods for the treatment of odors associated with municipal solid waste. Depending on the type of odor being controlled, such systems can utilize either i) masking agents or chemical counteractants to block odor sensing; or ii) odor absorbing agents or biological compounds that alter the decomposing process and prevent odors from being generated by increasing the population of aerobic microbes and preventing anaerobic conditions. The Facility has yet to finalize the type of odor control agent it will deploy in its system.

Synthesis Gas Gasification Production Units

The Facility's two synthesis gas generation units are each comprised of a gasifier, Plasma Enhanced Melter ("***PEM™***"), a thermal residence chamber ("***TRC***"), and a heat recovery system ("***HRS***"). The gasifier, PEM™ system and its residual materials are included in Plant Area A. The TRC and HRS are in Plant Area B, as discussed below.

Gasifier

Fulcrum's gasification process is a thermochemical technology, designed to convert Feedstock into marketable products utilizing a chemical reaction in an oxygen-lean, non-combustion environment. Fulcrum's gasification process will convert the Feedstock into the intermediate product, synthesis gas, which is further conditioned and processed to produce a final product--ethanol--and other co-products. The majority of the Feedstock will be converted into synthesis gas in the gasifier. Non-gasified material is further processed in the PEM™ system. The entire gasification train operates in an oxygen-lean environment.

PEM™ and Residual Materials

The PEM™ is a patented plasma-arc system that will process any un-reacted organic material that passes through the gasifier. Any un-reacted inorganic materials melt and form a molten glass pool at the bottom of the PEM™ chamber. Bulk metals, if present, are converted into a mixed metal alloy. The glassified in-organic materials, called vitrate, and metal are removed in the molten state and cooled. The metal recovered from the PEM™, along with any ferrous and nonferrous metal recovered from the Feedstock processing (discussed above) will be recycled along to the metals industry. The vitrate contains environmentally stable material that is non-leachable and can be used in a number of products such as construction materials or if necessary disposed of in accordance with applicable local, state and federal regulations in a non-hazardous classified landfill.

Plant Area B

Plant Area B consists of all other activities associated with the second step of Sierra BioFuels' process, including the products produced and materials and supplies purchased for use at the Facility and industrial waste generated. A block flow process diagram for Plant Area A is provided in **Exhibit ES-4**.

Thermal Residence Chamber and Heat Recovery System

The synthesis gas streams from both the gasifier and the PEM™ are routed to the TRC where additional residence time allows the gasification reactions to reach equilibrium. The synthesis gas discharged from each of the TRCs contains a mixture of hydrogen, carbon monoxide, carbon dioxide, nitrogen, steam, acid gases, and particulate. This hot synthesis gas leaves the TRC and flows into a dedicated HRS. The HRS recovers heat from the synthesis gas to pre-heat the feed gas stream entering the synthesis reactors.

Synthesis Gas Cleaning

The synthesis gas derived from the synthesis gas gasification system is ducted to the synthesis gas cleaning process to be dried to remove particulate and moisture, neutralized, filtered to remove trace contaminants, and compressed. The synthesis gas will be compressed to an intermediate pressure prior to removing sulfur utilizing an absorption process and then producing sulfur slurry that will be filtered. The resulting sulfur will either be sold or disposed of in accordance with all applicable regulations. Also at the intermediate compression stage, activated carbon guard beds will remove any remaining contaminants to protect the alcohol synthesis catalyst. The guard beds will be periodically removed and recycled by the bed provider. The synthesis gas will be compressed to a higher pressure prior to entering the alcohol synthesis loop to produce alcohol.

Ethanol Production

The conditioned gas will pass through a catalytic reactor to convert the synthesis gas into an ethanol product. Within the ethanol synthesis loop, excess carbon dioxide and other inert gases are removed to maintain the proper synthesis gas composition. The ethanol

product is then cooled and condensed prior to entering the alcohol separation equipment to remove excess water and any alcohol co-products before being sent to above-ground storage tanks, located in a diked area designed to provide secondary containment, to await shipment to market.

Storage Tanks

Ethanol from the ethanol synthesis loop is transferred to one of two ethanol day tanks within the Facility's tank farm, where samples will be obtained and tested against plant quality standards. Ethanol will then be either transferred to a single product storage tank, or transferred to a tank for off-specification material, where it will be recycled back into the process and reworked to make first quality ethanol. Ethanol from the ethanol storage tank will be loaded onto tanker trucks, using a loading arm. Gasoline from on-site storage will be blended in at a 5% by volume during the loading process as the denaturant for the ethanol.

All storage tanks, pumps, loading systems, and truck/rail cars during loading/unloading will reside within containment areas to provide containment protection in the case of spills and/or leaks. All ethanol and gasoline tanks will have vapor recovery systems to route any vapors to a flare.

Utilities

The Facility will utilize the normal utility supply systems to support the balance of the plant, including but not limited to, firewater storage, flare system, boiler, instrument air and plant air compressors and driers, cooling water system, emergency power generation, and wastewater treatment.

Exhibit ES-1 – Site Plan

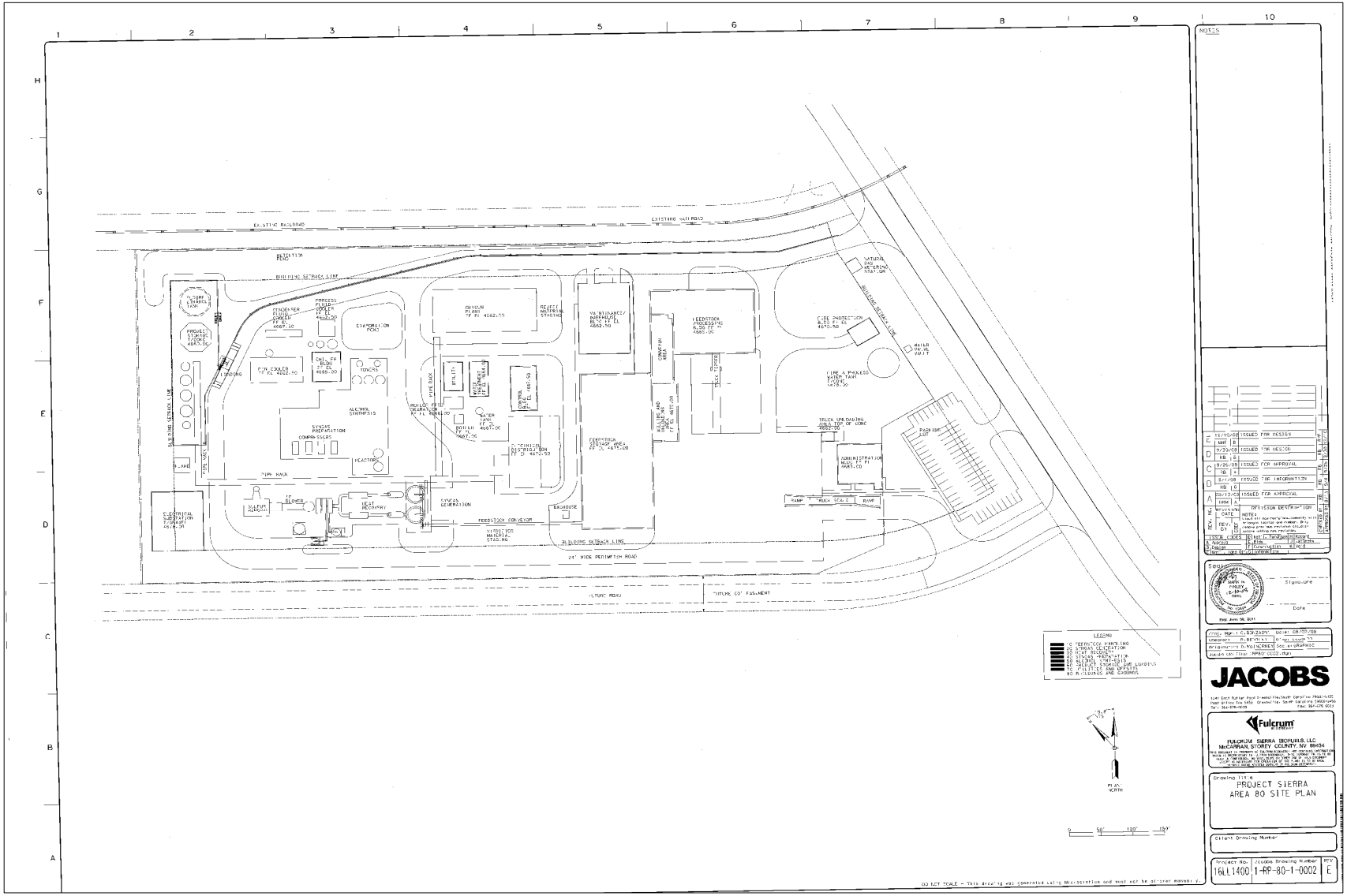

Exhibit ES-5 - Site Location Map

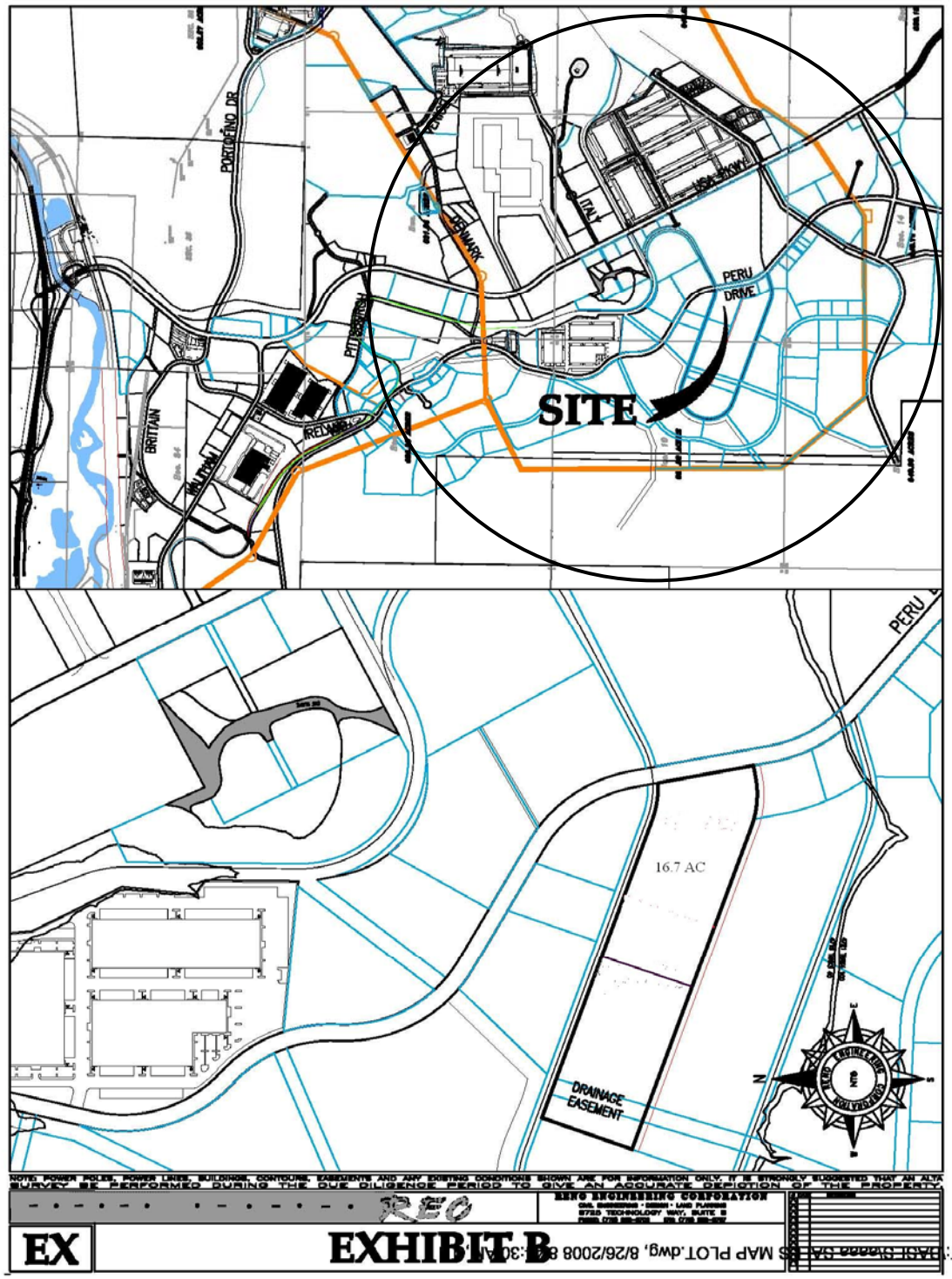

Exhibit ES-3 – Plant Area A Block Flow Process Diagram

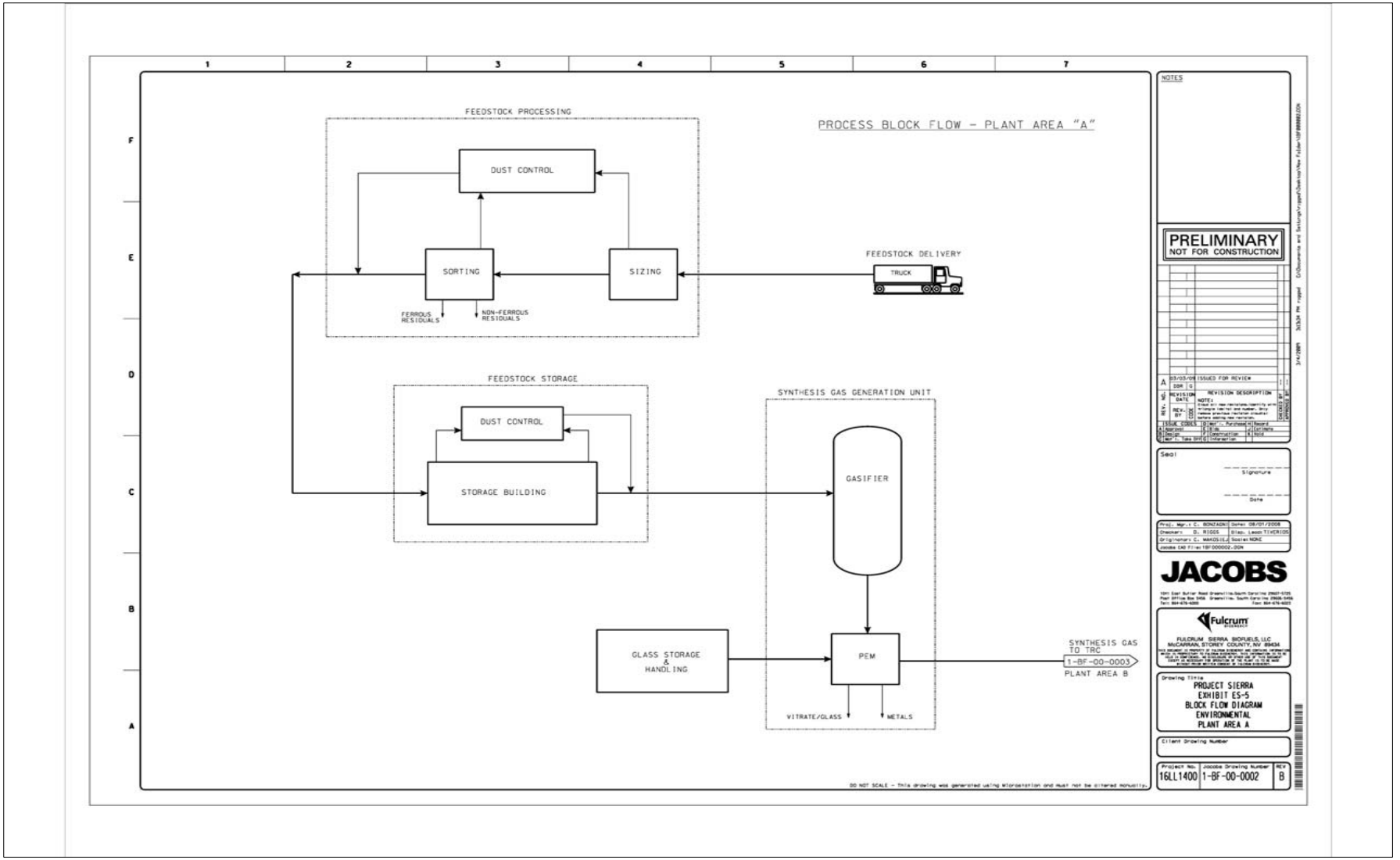

Exhibit ES-4 – Plant Area B Block Flow Process Diagram