

Supplement Analysis
for the
Environmental Assessment/Finding of No
Significant Impact

for the
Construction and Operation of a
Heterogeneous Feed Biorefinery
Enerkem Mississippi Biofuels LLC
Pontotoc, Mississippi

DOE/EA-1790

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Energy Efficiency and Renewable Energy



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1.0 Purpose

In September 2010, the U.S. Department of Energy (Department or DOE) published the final Environmental Assessment (EA) for the Construction and Operation of a Heterogeneous Feed Biorefinery, Enerkem Corporation, Pontotoc, Mississippi (DOE 2010). The associated Finding of No Significant Impact (FONSI) was published by the DOE on September 30, 2010. The EA was conducted to determine potential environmental and socioeconomic impacts that would result in the engineering, construction, start-up and operation of an integrated biorefinery to be located near the town of Pontotoc, Pontotoc County, Mississippi and that would use low-cost Municipal Solid Waste (MSW) and other biomass feedstock materials in an advanced gasification and gas clean-up and conditioning system to produce and convert clean synthesis gas (syngas) via catalysis into transportation fuels (the Project).

Subsequent to the issuance of DOE's FONSI, Enerkem has proposed several modifications to the project. Specifically, Enerkem has proposed to modify the location, layout, and water use parameters. NEPA encourages completion of environmental analysis early in the project development process, and as such, it is not unusual for project parameters to change from the preliminary designs analyzed in the EA. In compliance with NEPA (42 U.S. Code [USC] § 4321 et. seq.) and DOE's NEPA implementing regulations (10 Code of Federal Regulations [CFR] § 1021.330) and procedures, the purpose of this Supplement Analysis (SA) is to examine the potential environmental impacts of the proposed changes to the original project design in order to determine whether a Supplemental Environmental Assessment should be prepared.

This SA will be made publicly available on the DOE Golden Field Office Online Public Reading Room (http://www.eere.energy.gov/golden/Reading_Room.aspx).

1.1 Description of the Modified Proposed Project

The modified proposed project would include design, construction, and operation of a 330-ton- (300-metric-ton) per-day biorefinery in Pontotoc, Mississippi, that would use low-cost MSW and other biomass feedstock materials in an advanced gasification and gas clean-up and conditioning system to produce and convert clean syngas via catalysis into transportation fuels. The biorefinery would produce approximately 10 million gallons (36 million liters) of transportation fuels per year for commercial sale. The biorefinery would be sited adjacent to the Three Rivers Solid Waste Management Authority (TRSWMA) landfill site (Three Rivers Landfill). The Three Rivers Landfill is one of six regional solid waste authorities in the State of Mississippi. The post-sorted MSW would be supplied by a Materials Recovery Facility (MRF), which is not part of the scope of the DOE-funded activity. The MRF would be located within the landfill boundary and would be owned and operated by the Three Rivers Landfill.

The proposed project is based on technology that Enerkem's parent company has deployed at its demonstration plant in Westbury, Province of Quebec, Canada. The biorefinery would use a three-step thermochemical process for converting the carbon in waste into transportation fuels. Enerkem's proprietary gasifier and gas cleaning/conditioning system breaks down feedstock and turns it into syngas, essentially composed of hydrogen and carbon monoxide (CO). The clean syngas is converted into methanol and then into ethanol, although the process used in the biorefinery also would allow for the production of other biochemicals.

2.0 Proposed Action

This section presents a description of changes to the proposed project from the original EA (DOE 2010). Where changes have been made to the Project profile, the description presented in the original EA is summarized, followed by the proposed modifications. Those portions of the proposed project profile that have not changed are not discussed in the SA and therefore, the SA does not further discuss the following:

- DOE's Proposed Action
- Process Description
- Startup, Shutdown, Maintenance, and Emergency Conditions
- Decommissioning
- Permits, Approvals, and Applicant-Committed Actions
- No Action Alternative

The modifications to the proposed project include:

- Modified Project Location and Site Plan:
 - Enerkem is proposing to construct the biorefinery approximately 150 feet from the Three Rivers Landfill property on the west side of Beulah Grove Road to an adjacent site in the Industrial Park on the east side of Beulah Grove Road;
 - Biorefinery facility acreage would be increased from 12.5 acres (5.1 hectares) to 35 acres (14 hectares) (much of the additional acreage is green space and buffer);
 - MRF acreage would be increased from 2.0 acres (0.8 hectare) to 21.5 acres (8.7 hectares) (much of the additional acreage is green space and buffer);
 - Facility access roads would exit to the west (MRF) and east (biorefinery) of Beulah Grove Road.
- Modified Facility Description:
 - Major buildings and structures would remain largely unchanged, except for revisions to dimensions required for the new configuration of the facilities. The new location resulted in modifications to the feedstock delivery system and utility interconnections between the MRF and biorefinery fence lines;
 - Offsite utility routes would remain unchanged, but reroutes within the fenceline would be required;
 - Additional water, as discussed in Section 2.4, would be sourced from the Pontotoc Waste Water Treatment Plant (Pontotoc WWTP), as described in the original EA. A new water well is being installed and managed by the City of Pontotoc.
- Modified Construction Schedule: The start of construction would be adjusted to the second quarter of 2013.
- Modified Operations: The volume of cooling water required would increase, as would the volume of process water and blowdown discharged to the Industrial WWTP. The volume of fuel gas would also increase. These changes are noted in Table 2.4-1.

2.1 Project Location and Site Plan

Original Project Location and Site Plan

The biorefinery was proposed to be constructed within the permitted area of an existing Subtitle D landfill, the Three Rivers Landfill in Pontotoc County, Mississippi. The Three Rivers Landfill is located in Section 22, Township 9S, Range 2E, approximately 4.5 miles (7.2 kilometers) north of the City of Pontotoc and 17 miles (27.4 kilometers) west of Tupelo, Mississippi, on State Highway 76. The landfill is owned and operated by the TRSWMA. The landfill has operated since 1994 and has a design capacity of 13.8 million tons (12.5 million metric tons). The active landfill area currently occupies approximately 56 acres (23 hectares) of the over 700 acres (280 hectares) owned by TRSWMA.

Most of the process equipment would be located outdoors, although some of the supporting equipment would be housed within buildings. The biorefinery would contain six main areas: feedstock storage, gasification island, methanol production island, ethanol production island, waste water pretreatment, and final product storage.

Modified Project Location and Site Plan

As modified, the biorefinery would be constructed on a site adjacent to the Three Rivers Landfill property at the Three Rivers Industrial Site, (a.k.a. Industrial Park), about 150 feet away from the original site. The biorefinery area has been increased from 12.5 acres (5.1 hectares) to 35 acres (14 hectares) to incorporate additional green space and buffers. The process areas would remain substantially the same as in the original EA (DOE 2010), except for those changes resulting from further definition of ongoing design work, finalizing equipment size and providing the appropriate space necessary for equipment maintenance. The MRF location continues to be within the permitted area for the Three Rivers Landfill on the west side of Beulah Grove Road. The area of the MRF has increased from 2.0 acres (0.8 hectare) to 21.5 acres (8.7 hectares) to incorporate additional open space, green space, and buffers while the waste processing areas would essentially remain the same as in the original EA (DOE 2010). See Figure 2.1-1 for Project location and Figure 2.1-2 for details.

2.1.1 Roads and Facility Access

Original Roads and Facility Access

Vehicles would access the biorefinery via Beulah Grove Road, an existing gravel road running north-south adjacent to the Three Rivers Landfill site. In conjunction with construction of the biorefinery, Pontotoc County would improve approximately 3,000 feet (900 meters) of Beulah Grove Road from State Highway 76 past the Project site. These road improvements include paving the driving surface and adding shoulders and drainage ditches on either side.

To the south, Beulah Grove Road connects to State Highway 76, a four-lane divided highway, also known as Pontotoc Parkway. State Highway 76 connects to State Highway 15, a major access point to the City of Pontotoc. Highway 15 is located approximately two (2) miles (3.2 kilometers) from the entry point to Beulah Grove Road.

Trucks delivering waste to the Three Rivers Landfill site would continue to use existing landfill access roads. In addition, the landfill access road would be the primary road used for project vehicles and supplies during the construction phase.

Modified Roads and Facility Access

While with the prior site facility access roads were to exit to the west side of Beulah Grove Road (MRF and biorefinery), the site relocation results in a minor change in that facility access roads would now exit both to the west (MRF) and east (biorefinery) of this road. Pontotoc County would improve approximately 3,000 feet (900

meters) of Beulah Grove Road from State Highway 76 past the Project site. The landfill access road would continue to be the primary road used for project vehicles and supplies during the construction phase of the MRF. Beulah Grove Road would be the primary road used for project vehicles and supplies during the construction phase for the facilities that would be sited on the east side of Beulah Grove Road.

2.2 Facility Description

2.2.1 Major Buildings and Structures

Original Major Buildings and Structures

Construction and operation of the Enerkem biorefinery would not require either the demolition or translocation of any existing facilities, including the existing Three Rivers Landfill Office and Maintenance Shop. The major buildings and structures associated with the original project are listed, along with approximate size and a brief description of their purpose, in Table 2.1-1.

Modified Major Buildings and Structures

The major buildings and structures are unchanged except for some modifications to dimensions required for the new configuration of the facilities. The original and modified dimensions are shown in Table 2.2-1, below. The dimensions of the MRF buildings and structures were unavailable for the original EA (DOE 2010) but are given below.

| Table 2.2-1 | | | |
|--|--|--|-----------------|
| Major Buildings/Structures Associated with the Project | | | |
| Structure (Buildings, External Tanks, Major Equipment, etc.) | Description/Purpose | Estimated Structure Size Length x Width x Height (feet) | |
| | | Original | Modified |
| Biorefinery | | | |
| Gasification island | Conversion of feedstock into syngas | 130 x 60 x 115 | 116 x 44 x 91 |
| Methanol production island | Removal of carbon dioxide from syngas and conversion of syngas into methanol | 72 x 45 x 68 | 77 x 35 x 111 |
| Ethanol production island (includes Gas Separation Unit) | Conversion of methanol into ethanol. Includes separation of secondary syngas for Ethanol reactions | 72 x 45 x 68 | 323 x 255 x 152 |
| Methanol compressor shed | Methanol compression | 40 x 20 x 12 | 73 x 49 x 35 |
| Chiller shed | Intermediate and product temperature control | 20 x 10 x 10 | 44 x 22 x 16 |
| Waste water building | Houses waste water decanter, caustic soda, and sulfuric acid storage and maintenance shop | 120 x 50 x 40 | 130 x 130 x 40 |
| Feedstock storage building | Indoor storage of post-sorted, dried municipal solid waste | 120 x 120 x 60 | 123 x 114 x 47 |

| Table 2.2-1 | | | |
|--|--|--|-----------------------------|
| Major Buildings/Structures Associated with the Project | | | |
| Structure (Buildings, External Tanks, Major Equipment, etc.) | Description/Purpose | Estimated Structure Size Length x Width x Height (feet) | |
| | | Original | Modified |
| Cooling tower | Cooling tower | 40 x 16 x 40 | 50 x 63 x 32 |
| Motor Control Center (MCC) | Monitoring and control | 50 x 20 x 14 | 181 x 23 x 25 |
| Heat exchanger shed | Intermediate cooling | 20 x 10 x 12 | N/A |
| Product storage tanks | Ethanol storage tanks | 30 (diameter) x 30 (height) | 30 (diameter) x 20 (height) |
| Office building | Office space, process control room, change rooms, washrooms and laboratory | ~6,000 square feet (SF) | 20,000 square feet (SF) |
| Oxygen storage area | Process reactant | 120 x 140 | In ASU Site (N/A) |
| Nitrogen storage | Injected in several places in the process in case of emergency shutdown | 20 (diameter) x 70 (height) | In ASU Site (N/A) |
| MRF | | | |
| Receiving area | Loading docks, storage of unsorted material | 73,000 SF | |
| Processing building | Process material storage/production | 53,000 SF | |
| Administrative building | Office space, process control room, | 3,000 SF | |
| Wood Buildings | Storage of wood pulp material | 15,000 SF and 7,500 SF | |

2.2.2 Utilities

Enerkem would require additional process/make-up water, as described in Section 2.4. Enerkem would obtain the majority (approximately 85%) of this water [average 800,000 gallons (3.0 million liters) per day] from the effluent loop of the Pontotoc WWTP, as described in the original EA. Enerkem is currently in discussion with the City of Pontotoc and plans to obtain an additional 150,000 gallons (570,000 liters) per day, average, through the City's utility system. The utility system will be upgraded with a new, production-scale water well to support development at the Pontotoc Industrial Park. The well will be permitted, constructed, and managed by the City. The water well would draw water from the Black Warrior River Aquifer (BWRA), which includes the Coker, Gordo, and Eutaw Formations (USGS, 2002). Based on published well yields from public water supply wells in Pontotoc County, Mississippi and completed in the Gordo Formation, a single well is capable of producing 720,000 to 1,080,000 gallons per day (MDEQ, 2009).

Enerkem would require additional natural gas for consumption, as described in Section 2.4. This is for the gas separation unit reactions, that are endothermic, as well as for energy generation required in Enerkem's process.

No significant changes to the utility routes are required for the modified Project. That is, the only changes required are to the interconnections within the original or modified fence line of the MRF or biorefinery. Therefore, the existing EA adequately evaluated the potential impacts with regard to utilities.

2.3 Construction

Items reviewed under the Construction heading would not be affected by the Project modifications with the exception of adjustments to the Construction Schedule, as provided below.

2.3.1 Construction Schedule

Original Construction Schedule

Construction of the biorefinery was originally scheduled for January 2011. Commissioning and the start-up process were originally scheduled for October 2011, while continuous operations were planned for December 2012.

Modified Construction Schedule

Construction start has been adjusted to the second quarter of 2013. Construction is anticipated to be completed within twelve to eighteen months of commencement of construction.

2.4 Operations Description

The operations description is unchanged from the original EA except for the Material Balance and Logistics Section, detailed below.

Original Material Balance and Logistics

The Project would use the dried and sorted biomass fraction of MSW. The MSW feedstock would be presorted in a separate MRF, and then transferred by covered conveyor to the biorefinery to be processed. Throughput of the biorefinery is 330 dry tons (300 dry metric tons) of feedstock per day. The MRF would only convey the material that can be processed during a one-day cycle. Enerkem would return excess material from the MRF to the landfill for normal processing.

The Project originally required 450,000 gallons (1.7 million liters) per day of effluent water from the Pontotoc WWTP for cooling and 2.2 tons (2 metric tons) per day of natural gas as auxiliary fuel.

Modified Material Balance and Logistics

The modified Project would use 950,000 gallons (3.6 million liters) per day of effluent water from the Pontotoc WWTP for cooling, an increase of approximately 500,000 gallons (1.9 million liters) per day from the 450,000 gallons (1.7 million liters) per day required by the original Project. The source of this water, a pipeline loop to the Pontotoc WWTP, remains the same as described in the original EA. The discharged process water would be sent to the Pontotoc WWTP, unchanged from the original EA. However, the average flow of wastewater from the City's WWTP is approximately, 800,000 gallons per day. The make-up would come from a new off-site well to be built by the City of Pontotoc. However, even with the supplemental water, Enerkem's process would still use approximately 85% grey water and 15% fresh water.

The modified Project would use a conservative estimate of 27.1 tons of natural gas per day. A fraction of this consumption is to provide energy to Enerkem's process, which is in a slight energy deficit. The other part of this natural gas consumption is for the gas separation unit where light hydrocarbons are cracked into hydrogen and carbon monoxide in order to improve Enerkem's yield. This reaction is endothermic, meaning that a heat source must be provided in order for it to take place. The choice of technology for this reaction is not finalized; the worst case technology for natural gas consumption is used for the NEPA analysis as shown in Table 2.4-1.

The material balance for original and modified biorefinery operations is provided in Table 2.4-1.

| Table 2.4-1 | | |
|--|---|---|
| Material Balance Associated with Operation of the Enerkem Biorefinery | | |
| Input/Output | Original Quantity | Modified Quantity |
| Inputs | | |
| Feedstock MSW | 330 dry tons (300 dry metric tons) per day | Unchanged |
| Water make-up from Pontotoc WWTP (cooling tower) | 450,000 gallons (1.7 million liters) per day* | 800,000 gallons (3.0 million liters) per day* |
| Water make-up from City of Pontotoc | n/a | 150,000 gallons (570,000 liters) per day* |
| Process water from water well | 5,000 gallons (19,000 liters) per day* | 0 gallons (0 liters) |
| Auxiliary fuels (Natural Gas / Diesel) | 2.2 tons (2 metric tons) per day | 27.1 tons (24.6 metric tons) per day |
| Electricity | 6,500 kW | 7,500 kW |
| Chemicals, Catalysts, Guard Bed Materials | 15 tons (13.5 metric tons) per day | Unchanged |
| Oxygen (O ₂) | 203 tons (184 metric tons) per day | 225 tons (204 metric tons) per day |
| Denaturing agent (gasoline) | Blended with Ethanol (Quantity TBD) | Unchanged |
| Outputs | | |
| Ethanol | 93 tons (84 metric tons) per day | Unchanged |
| Cooling tower blowdown | 145,000 gallons (550,000 liters) per day* | 180,000 gallons (700,000 liters) per day* |
| Cooling tower evaporative loss | 305,000 gallons (1.2 million liters) per day* | 550,000 gallons (2.1 million liters) per day* |
| Process Water to Industrial WWTP | 67,000 gallons (254,000 liters) per day* | 100,000 gallons (370,000 liters) per day* |
| Boiler Feed Water Blowdown | N/A | 40,000 gallons (150,000 liters) per day |
| Residual Gas | 66 tons (60 metric tons) per day | Unchanged |
| Solids | | |
| Gasifier Solid Residues (GSR) | 16.8 tons (15.2 metric tons) per day | Unchanged |
| Char | 41.7 tons (37.8 metric tons) per day | Unchanged |
| Spent catalysts and guard beds | 950 pounds (430 kilograms) per day | Unchanged |
| Liquids | | |
| Treated purged water | 137 tons (124 metric tons) per day | Unchanged |
| Inorganic sludge | 6.3 tons (5.7 metric tons) per day | Unchanged |
| Gases | | |
| Waste heat recovery unit | Totals included in Potential Air | Unchanged |

| Table 2.4-1 | | |
|---|---|-------------------|
| Material Balance Associated with Operation of the Enerkem Biorefinery | | |
| Input/Output | Original Quantity | Modified Quantity |
| emissions | Emissions, original EA | |
| Steam boiler and superheater emissions | Totals included in Potential Air Emissions, original EA | Unchanged |
| CO ₂ | Totals included in Potential GHG Air Emissions, original EA | Unchanged |
| Non-hazardous solid waste | <2 tons (1.8 metric tons) per day | Unchanged |
| Potential Air Emissions | | |
| PM | 21.27 tons (19.30 metric tons) per year [‡] | Unchanged |
| PM ₁₀ | 21.27 tons (19.30 metric tons) per year [‡] | Unchanged |
| NO _x | 67.06 tons (60.84 metric tons) per year [‡] | Unchanged |
| CO | 87.89 tons (79.73 metric tons) per year [‡] | Unchanged |
| VOCs | 55.42 tons (50.28 metric tons) per year [‡] | Unchanged |
| SO ₂ | 11.23 tons (10.19 metric tons) per year [‡] | Unchanged |
| Hazardous Air Pollutants (HAPs) | | |
| Highest Single HAP (Acetaldehyde) | 3.39 tons (3.08 metric tons) per year [‡] | Unchanged |
| Total HAPs | 7.14 tons (6.48 metric tons) per year [‡] | Unchanged |
| Greenhouse Gases (GHGs) | | |
| CO ₂ | 71,393 tons (64,767 metric tons) per year [‡] | Unchanged |
| Methane | 114 tons (103 metric tons) per year [‡] | Unchanged |
| N ₂ O | 23.81 tons (21.60 metric tons) per year [‡] | Unchanged |
| O ₃ | Not directly emitted | Unchanged |
| <p>*Water volumes are maximum, worst-case values. [‡]Air emissions are calculated based on year-round (8,760 hours) processing.</p> <p>Acronyms CO – carbon monoxide CO₂ – carbon dioxide GHGs – greenhouse gases GSR – gasifier solid residues HAPs – hazardous air pollutants kW – kilowatt N₂O – nitrous oxide NO_x – nitrogen oxides O₂ – oxygen O₃ – ozone PM – particulate matter</p> | | |

Table 2.4-1

Material Balance Associated with Operation of the Enerkem Biorefinery

| Input/Output | Original Quantity | Modified Quantity |
|--|--------------------------|--------------------------|
| PM ₁₀ – particulate matter of ≤10 microns | | |
| SO ₂ – sulfur dioxide | | |
| VOCs – volatile organic compounds | | |

3.0 Potential Environmental Impacts of the Modified Project

3.1 Land Use

Under the Proposed Action, the biorefinery would occupy 35 acres (14 hectares) of land within the Pontotoc Industrial Park. The MRF, which would continue to be within the Pontotoc Landfill boundaries (and owned by the TRSWMA) would be expanded to 21.5 acres (8.7 hectares) to accommodate support structures, access roads, etc, as shown in Figure 2.1-2. These revisions in facility size and location would allow for safer and more efficient operation of the facility and incorporation of greenspace and buffers into the layout.

Currently the Pontotoc Industrial Park and Pontotoc Landfill contain mostly planted pines that are approximately 15 years old. The site of the Three Rivers Landfill comprises approximately 208 acres (84 hectares) that are permitted as a Subtitle D landfill. The landfill site is used for commercial/industrial purposes but there are no zoning restrictions. The surrounding area is mostly forested land, pasture, and industrial property. Beyond the adjacent land use, the surrounding area is made up of forest and farmland mixed with occasional low-density residential development. The nearest residences are approximately 500 feet (150 meters) from the Three Rivers Landfill property.

Land use is shown in Figure 3.1-1.

The Proposed Action would result in similar short-term and long-term impacts to land use as described in the original EA, notwithstanding the increase in acreage. Land use impacts based on the current revision are described below and are summarized in Table 3.1-1.

Energkem Biorefinery – During operations, the biorefinery would occupy approximately 35 acres (14 hectares) of undeveloped land, currently vegetated in planted pine. This area includes sufficient space for construction procurement, laydown, construction offices, etc., which would remain as open, industrial space within the facility fenceline for potential expansion to a two-module facility. The biorefinery would occupy this area for approximately 30 years.

Materials Recovery Facility (MRF) – The MRF would occupy approximately 21.5 acres (8.7 hectares) of land, similar to that discussed above for the Energkem biorefinery. The location of the MRF is still within the permitted area for the Three Rivers Landfill as presented in the originally submitted EA.

Air Separation Unit – Oxygen for the gasification process would be supplied by an air separation unit (ASU). The ASU was originally described as a stand-alone facility but has been incorporated into the expanded footprint of the biorefinery. Additional oxygen, if needed, would be delivered by truck and it would be stored on the ASU site.

Electrical Substation – The electrical substation would occupy approximately 6.9 acres (2.8 hectares) of undeveloped upland near the southwest corner of the biorefinery facility and be operated by the Pontotoc Electric Power Association (PEPA). This land is currently vegetated with planted pine.

| Table 3.1-1 | | | | | | | | | |
|--|------------------|-------------|-----------------------|------------|---|--|------------------------|---|------------------------|
| Acres of Land Permanently Impacted by Operation of the Project | | | | | | | | | |
| Existing Land Use Classification | Land Use (Acres) | | | | | | | | |
| | Biorefinery‡ | MRF | ASU and Oxygen Piping | Substation | Cooling Water Pipeline Loop and Natural Gas Pipeline (collocated)* ^u | Waste Water Discharge Pipeline* ^u | Powerline ^u | Road Improvement (Beulah Grove Road) † ^u | Project Total |
| Planted Pine | 34.9 | 17.1 | - | 6.9 | 1.3 ^u | 1.4 ^u | 4.5 ^u | 3.2 ^u | 69.3 |
| Commercial / Industrial | - | 4.7 | - | - | - | - | - | - | 4.7 |
| Right-of-way | - | - | - | - | -. ^{* u} | -. ^{* u} | - | - | -. ^{* u} |
| Upland Forest | - | - | - | - | 0.3 ^u | - | 0.5 ^u | - | 0.8^u |
| Total | 34.9 | 21.8 | - | 6.9 | 1.6^u | 1.4^u | 5.0^u | 3.2^u | 74.8 |
| ‡ Includes Potable Water Piping and Process Water Piping. † Powerline Alternative Route #2 (the longer route); Assumes overlap between Powerline and Beulah Grove Road improvement. *An additional 24.3 acres (9.8 hectares) of right-of-way would be temporarily impacted by construction but allowed to return to pre-existing conditions following construction. ^u Unchanged from original project. | | | | | | | | | |

The remaining structures and related facilities would only vary in proximity and size within the footprint of the MRF and biorefinery.

There are no modifications to the utility corridors.

3.1.1 Conclusion Regarding Land Use

Although the area of land affected by the Project has increased, the types of land to be affected have not changed, and no significant change in land-use impact would occur as a result of modifications to the Project. Therefore, the existing EA adequately evaluated the potential impacts from modified Project land use.

3.2 Noise

The modified biorefinery site would be located within the southern portion of the Pontotoc County Industrial Park; the MRF would remain in essentially the same area as identified in the original EA. The noise sensitive

area (NSA) closest to the Project would include a residence, located in an area containing three (3) residences total, approximately 930 feet (283 meters) from the MRF and 1,575 feet (480 meters) from the biorefinery, based upon interpretation of aerial photography. The day-night average sound level, designated Ldn, is defined as the average noise level over a 24-hour period with the noise between the hours of 10 p.m. and 7 a.m. artificially increased by 10 decibels (dB) to account for the decrease in community background noise during this period. Rural populations enjoy average outdoor sound levels generally lower than Ldn = 50 dB (Schultz 1978), and a level of 55 dB outdoors is identified as preventing activity interference and annoyance (EPA 1974).

Enerkem estimates that the highest noise levels would occur during construction of the plant and associated facilities. Enerkem would generate a maximum noise level during construction in the range of 82 to 105 dBA (dB, A-weighted scale) at the source from pile-driving equipment (Eaton 2000), if pile driving is required. (Because sound pressure varies across the audible spectrum, decibels on an A-weighted scale are used to approximate the human ear's sensitivity to various frequencies.) Geotechnical data, to be collected prior to construction, would be used to determine whether pile driving is necessary.

The equation below (Beranek et al. 1992) can be used for evaluating the noise loss before reaching the NSA:

$$\text{SPL 2} = \text{SPL 1} - 20 \text{ Log } 10 (d2/d1).$$

Where:

SPL 2 is the sound pressure level at the NSA,
SPL 1 is the sound pressure level contribution from the noise source,
d1 is the distance at which SPL1 is measured, and
d2 is the distance to the NSA.

Using the above equation, and assuming pile-driving noise at 98 dBA (average, per Eaton 2000), Enerkem would generate an estimated noise level at the closest NSA (residence 930 feet [750 meters] away) of approximately 54 dBA, which is similar to the normal background level for rural agricultural areas and just below the EPA outdoor limit of 55 dB (EPA 1974). Pile driving, if it is required, would be a short-term activity conducted during daylight hours.

The chemical processes of the biorefinery would not generate elevated noise levels, but mechanical equipment may. Noise sources from the Project during operations would be related to:

- Feedstock handling and processing equipment, including conveyors;
- Compressors;
- Cooling towers; and
- Materials handling equipment (e.g., front-end loaders, forklifts, etc.).

Based on typical noise profiles, this type of equipment can generate from 70 to 86 dBA. From the above equation, the estimated noise level at the closest NSA associated with operations would be approximately 42 dBA. The noise level associated with the equipment typically used for existing landfill operations (which would continue even under the No Action Alternative) is in this same range (e.g., 86 dBA average for a backhoe, Eaton 2000), and the combined noise level could approach 50 dBA. The maximum calculated noise level of 50 dBA would be within the normal background level for a residence with a typical movement of people and possibly an air conditioner (40-60 dBA: Jones & Stokes Associates 1999). Therefore, operation of the biorefinery would not generate noise levels above the decibel range routinely encountered in the area.

3.2.1 Conclusion Regarding Noise

Although the modified Project location reduces the distance to the nearest NSA and would likely cause a minor increase in noise levels at that point, the estimated noise levels remain below EPA outdoor limit (55 dBA). It should also be noted that the calculated noise levels assume unobstructed noise transmission and do not account for the noise-attenuating effects of vegetation. The substantial vegetative buffer (planted pine) surrounding the southern boundary of both the MRF and biorefinery would likely reduce the noise level below that estimated above. The overall noise signature for the facility would be controlled to the levels that prevent noise impact above the EPA guideline of 55 dBA at the nearest residence.

3.3 Visual and Aesthetic Resources

Modifications to the Project would not change the anticipated short-term visual impacts resulting from ground disturbance; the presence of workers, vehicles, and equipment; and the generation of dust and vehicle exhaust associated with construction of the biorefinery and related infrastructure. Equipment would be visible, especially along transportation corridors during pipeline and powerline construction. However, construction activities would last a few months, and have only short-term effects on surrounding aesthetics.

Most of the structures are less than two stories tall, and the surrounding planted pine would screen ground-level structures and activities of the biorefinery and support facilities from view. Enerkem's tallest structure, the Ethanol Island, is 153 feet (47 meters) tall. The next tallest structures are the Gasification and Methanol Islands, which would be 116 feet (35 meters) and 103 feet (31 meters) tall, respectively. The tops of these structures would protrude above the surrounding forest and would likely be visible from nearby residences, as well as motorists on State Highway 76, who would pass within approximately 0.5 mile (0.8 kilometer) of the site. As a result of proposed modifications to the site, an enclosed conveyor belt would be installed across Beulah Grove Road to transport materials from the MRF to the biorefinery. If an overhead conveyor-belt design is selected, this structure would be visible to motorists. These structures would not compromise scenic vistas. Because of the relatively low population density, the distance from most observers, and the general use of this area for commercial/industrial purposes, the addition of these industrial structures would not result in unacceptable impacts to aesthetics.

The underground water pipelines and natural gas pipeline would have no effect on surrounding aesthetics during operations. The aboveground power transmission lines would parallel existing utility corridors where possible and have minimal long-term effects on visual resources. The improvements to Beulah Grove Road would improve the aesthetics of this transportation corridor. These minimal alterations to the viewshed would have neutral or positive aesthetic impacts.

3.3.1 Conclusion Regarding Visual and Aesthetic Resources

Because of the similarity in use, buildings and structures, and visual buffers, no significant change in appearance would occur as a result of modifications to the Project. Therefore, the existing EA adequately evaluated the potential impacts from modified Project aesthetics.

3.4 Geology and Soils

Enerkem consulted the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic database (NRCS 2010) to identify soils within the modified Project site boundaries that were not described in the original EA. Figure 3.4-1 depicts the soils underlying the modified Project boundaries. The soils within the modified Project site are similar to those within the original site. A single soil association, not included in the original EA, was affected. The following NRCS *Official Soil Series Description* provides a general description of the additional soil series affected:

- Providence Series – The Providence series consists of moderately well drained soils with a fragipan. Permeability is moderately slow. These soils formed in a mantle of silty materials, about two (2) feet thick, and the underlying sandy and loamy sediments. They are nearly level to moderately steep soils in uplands and on stream terraces of the Southern Coastal Plain and Southern Mississippi Valley Silty Uplands Major Land Resource Areas. Slopes range from 0 to 15 percent.

The Tippah-Providence-Wilcox association (TWE) shown in Table 3.4-1 is an association of the Tippah, Providence, and Wilcox soil series. The Tippah and Wilcox series were described in the original EA, while the Providence series is described above. Information on the Providence map unit was provided in Table 3.5-1 in the original EA.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. They can be an indicator of the potential presence of wetlands. Partially hydric soil components were identified in the Tippah-Providence-Wilcox association, Commerce, Mayhew, Urbo, and Wilcox series soils using the Soil Survey Data. Please see section 3.5, below, for a discussion of wetlands.

| Table 3.4-1 | | | | | | | | |
|--|---|-----------------------------|---------------------------|--------------------------------|-----------------------------------|------------------------------|--------------------|-------------------------|
| Soil Associations and Major Soil Limitations of Soils Within the Modified Project Site Not Described in the Original EA | | | | | | | | |
| Map Unit | Map Unit Name | Prime Farmland ^a | Hydric Soils ^a | Erosion Potential ^b | Compaction Potential ^c | Shallow Bedrock ^d | Slope ^a | Drainage class |
| TWE | Tippah-Providence-Wilcox association, hilly | No | Partially Hydric | Severe | No | No | 8-30% | Moderately well drained |

^a As designated by USDA-NRCS National Hydric Soils List by State (2010).
^b Soil components that have a Land Capability Class of 3 through 8 and a Subclass of "E."
^c Soil that has a surface texture of sandy clay loam or finer and a poorly drained or very poorly drained drainage class.
^d Shallow Depth to Bedrock or Coarse Fragments: refers to the potential for shallow depths to bedrock, less than 60 inches (150 centimeters), or coarse fragments.

The Project would require clearing, grading, excavation, and site-development activities.

Underlying soils and geology were not significantly changed by the modified Project siting; therefore, the adequacy of soil conditions for support of construction and operation of the Enerkem biorefinery would not be affected.

Land within the Three Rivers Landfill and Three Rivers Industrial Site is already committed to commercial / industrial development (as noted in Table 3.1-1, Land Use) and is not considered prime farmland (as defined by the Farmland Policy and Protection Act of 1981). Although the modified Project site has changed from the original EA, the Project areas remain within the confines of the Three Rivers Landfill and the Three Rivers Industrial Site. Therefore, the discussion regarding prime farmland is unchanged from the original EA.

3.4.1 Conclusion Regarding Geology and Soils

Because of the similarity in structure and composition of the soils and geology, no significant change would occur as a result of modifications to the Project. Therefore, the existing EA adequately evaluated the potential impacts from modified Project soils and geology.

3.5 Water Resources

Groundwater

Energem is currently in discussion with the City of Pontotoc and plans to obtain a portion of the Project's water requirements [150,000 gallons (570,000 liters) per day, average] through the City's utility system. To ensure that system capacity can accommodate the additional withdrawal requirements, the utility system would be upgraded with a new, production-scale water well, which would be permitted, constructed, and managed by the City. The water well would draw water from the Black Warrior River Aquifer (BWRA), which includes the Coker, Gordo, and Eutaw Formations (USGS, 2002). Based on published well yields from public water supply wells in Pontotoc County, Mississippi and completed in the Gordo Formation, a single well is capable of producing 720,000 to 1,080,000 gallons per day (MDEQ, 2009). The City of Pontotoc would comply with all necessary permitting and applicable regulatory requirements for construction and operation of the water well.

Surface Water

The findings of the original EA remain unchanged for the Project watershed, exclusion from FEMA's 100-year and 500-year floodplain, wetland and waterbody data for utility crossings, wetland and waterbody construction techniques for utility crossings, and absence of public surface water intakes within 2,500 feet (760 meters) of the project site.

Wildlife Technical Services, Inc (WTI) conducted a wetland and waterbody delineation of the Three Rivers Landfill in 2009. The location of the MRF and biorefinery sites in relation to the jurisdictional wetlands and waterbodies is shown in Figure 3.5-1. There are no wetlands in these sites. A waterbody runs along the northern boundary of the biorefinery site and would be protected through establishment of a 50-foot buffer around this feature; no land-disturbing activities would occur within the buffer. A drainage ditch runs along the western edge of the MRF site. The surrounding area is already in industrial use for truck scales associated with landfill operations.

The use of additional water from the Pontotoc WWTP effluent loop for evaporative cooling would reduce the volume of water returned to the Pontotoc WWTP and released at the WWTP's discharge point. Energem has confirmed with the Pontotoc WWTP that the modified volume of water and concentration of constituents are in compliance with the WWTP's operating permit (Permit No. MS0058581).

3.5.1 Conclusion Regarding Water Resources

Because of the similarity in resources and construction techniques applied for water resources, no significant change to surface water impacts would occur as a result of modifications to the Project as discussed in Section 3.5. Upgrades to the City of Pontotoc's water supply utility system would increase groundwater uptake, which would be addressed through their permitting and regulatory requirements. Therefore, the existing EA adequately evaluated the potential impacts from the modified Project on water resources.

3.6 Biological Resources

Although modifications to the Project have increased the site area and shifted its location, there are no significant changes to the vegetation and wildlife resources.

3.6.1 Fishery Resources

Although the volume of water returned to the Pontotoc WWTP would be reduced, the discharge-water volume and concentration of constituents would be in compliance with the WWTP's operating permit, and would not be expected to affect the fisheries resources of the receiving waterbody (Lyon Creek).

The utility routes and associated fishery resources are unchanged from the original EA.

3.6.2 Threatened and Endangered Species

Enerkem initiated informal consultation with the U.S. Fish & Wildlife Service (USFWS) and the Mississippi Department of Wildlife, Fisheries, & Parks (MDWFP) regarding the potential presence of federal or state listed threatened or endangered species and/or designated critical habitat for listed species within the Project vicinity. A copy of the agency correspondence and clearance letters provided can be found in Appendix B.

Based on the USFWS record of threatened and endangered species by county in the state of Mississippi, only one species was identified as potentially present within Pontotoc County: the stirrupshell (*Quadrula stapes*) (USFWS 2010). This species is federally listed as Endangered in the State of Mississippi. Where proposed utilities cross waterbodies, horizontal directional drill (HDD) techniques would be used to avoid disturbance of the waterbody and the species, including stirrupshell, within them. The volume and concentration of constituents discharged by the Pontotoc WWTP would be in compliance with the WWTP's operating permit, and would not be expected to affect the protected species potentially present in the receiving waterbody.

The Mississippi Natural Heritage Program of the MDWFP listed Price's potato bean (*Apios priceana*) as occurring within two (2) miles (3.2 kilometers) of the project site. This species is federally listed as threatened in the State of Mississippi. The modified Project site is vegetated with planted pine and does not represent suitable habitat, and therefore this Project would have no effect on this species.

The MDWFP also identified that black bears (*Ursus americanus*) recently had been observed within approximately two (2) miles (3.2 kilometers) of the Project site. The black bear is a rare species in Mississippi and due to similarity of appearance to the federally threatened Louisiana black bear subspecies, it is protected throughout Mississippi. It is believed that the black bear(s) observed in Pontotoc County were transient individuals that had wandered from areas of habitat elsewhere. The immature planted-pine habitat areas affected by the Project are generally not preferred black bear habitat types. It is anticipated that the Project would not adversely affect black bears using the area.

Although the bald eagle (*Haliaeetus leucocephalus*) is no longer listed as a threatened or endangered species, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The immature planted-pine habitat within the modified Project site does not provide suitable habitat for these birds.

3.6.3 Conclusion Regarding Biological Resources

Because the original Project site and the modified Project site would affect the same type of habitat, no significant change to impacts would occur as a result of the modifications to the Project. This habitat is not suitable for the protected species potentially occurring in the vicinity of the project. Discharge from the Pontotoc WWTP would remain within that facility's operating permit and no significant impacts to protected species currently or potentially present in the receiving waterbody would occur. Therefore, the existing EA adequately evaluated the potential impacts from the modified Project on biological resources.

3.7 Cultural Resources

Under the Project modifications, the footprint of the MRF would be expanded in the current location, within the Three Rivers Landfill boundary. The footprint of the biorefinery would be expanded and relocated to the east of Beulah Grove Road, within the Pontotoc Industrial Park. The Mississippi Department of Archives and History (MDAH) was consulted in 1997 regarding potential expansion of the landfill (into the area now classified as the Industrial Park) and determined that no properties listed in or eligible for listing in the National Register of Historic Places (NRHP) were present on the property. Enerkem initiated informal consultation with the MDAH's Historic Preservation Division concerning the original project location on June 25, 2010. On July 12, 2010, MDAH issued a clearance letter with its determination that no cultural resources would likely be affected. A copy of this correspondence is provided in Appendix B. Enerkem has submitted an updated informal consultation request to the MDAH (April 2012) to confirm that no cultural resources would be affected in the new site.

There are three sites listed on the National Register of Historic Places in Pontotoc County: Lochinvar Plantation, Pontotoc Historic District, and the Treaty of Pontotoc Site. All three sites are located more than five miles from the Project location and would not be affected.

The utility routes and footprints associated with the Project have not changed.

3.7.1 Conclusion Regarding Cultural Resources

Because no NRHP-listed sites occur near the Project site and no potential for cultural resources to be present was identified during the 1997 or 2010 consultations, it is unlikely that cultural resources would be affected at the location. On May 8, 2012, MDAH issued a clearance letter with its determination that no cultural resources would likely be affected based on the modified Project location. A copy of this correspondence is provided in Appendix B.

3.8 Utilities and Energy

3.8.1 Environmental Consequences of Proposed Action

The source of natural gas, water, and power utilities would be unchanged from the original EA.

The volume of water supplied from the Pontotoc WWTP effluent loop and discharged to the City's WWTP would increase, but the route and size of the pipelines would not change. The volume of natural gas supplied to the modified Project site would increase, but the route and size of the pipelines would not change.

3.8.2 Conclusion Regarding Utilities and Energy

Modifications to the Project would affect the water use from the effluent loop from the Pontotoc WWTP and the volume of cooling tower blowdown discharged to the City's WWTP, as well as natural gas consumption, however these changes would not alter the utility routes or the construction impacts. The conclusions reached in the original EA regarding Utilities and Energy remain unchanged.

3.9 Transportation

Beulah Grove Road is an existing, two-lane, gravel road that divides the Three Rivers Landfill property from the Three Rivers Industrial Site property. Modifications to the Project have changed the Project location to include Project access points from both the east and west sides of Beulah Grove Road, as opposed to the configuration presented in the original EA in which all Project access occurred on the west side of Beulah Grove Road. Pontotoc County would pave approximately 3,000 feet (900 meters) of Beulah Grove Road in

association with development of the biorefinery. The planned paving of Beulah Grove Road is intended to mitigate dust and noise, and enhance safety for citizens and businesses in the area.

As there are no modifications being made to process volumes, the traffic patterns and volumes discussed in the original EA are unchanged.

3.9.1 Conclusion Regarding Transportation

Modifications to the Project would not change the anticipated transportation impacts resulting from construction and operation of the Project as presented in the original EA.

3.10 Irreversible and Irretrievable Commitments of Resources

Development of the Project would commit the land to be occupied by the MRF from future landfill use to permanent use by the Project. Enerkem would more than offset this commitment of area by the estimated 90 percent reduction in landfilled volume (and therefore increase in landfill operating lifespan) during the 30-year lifespan of the biorefinery. The Project would also commit the land to be occupied by the biorefinery from planted pine to industrial use. This area is part of the Industrial Park, and conversion to industrial use is consistent with its intended use. The modified Project would increase the volume of water from the effluent stream of the Pontotoc WWTP committed to cooling purposes rather than being discharged to Lyon Creek, the receiving waterbody. This water would be evaporated into the atmosphere or discharge to the City's WWTP. The evaporated water would eventually condense and return to the earth in the form of rainfall; however, the rainfall would not occur in the immediate Project vicinity.

These commitments would result in the production of approximately 10 million gallons (36 million liters) per year of ethanol. By providing a renewable, non-petroleum source of fuel, the Enerkem project would reduce the commitment of petroleum, a non-renewable resource. There would be a generally consistent relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity.

3.10.1 Conclusion Regarding the Irreversible and Irretrievable Commitments of Resources

The potential impacts of the modified Project on the environment are similar in type to those described in the existing EA. Therefore, the existing EA adequately evaluated irreversible and irretrievable commitments of resources.

3.11 EA Study Elements Not Affected by the Modifications to the Project

Certain resources previously evaluated in the original EA would not have potential for additional or altered impacts as a result of the proposed modification. The SA does not further evaluate potential impacts to these resources (see Table 3.11-1).

| Table 3.11-1 | |
|--|---|
| List of EA Study Elements Not Affected by the Biorefinery Modifications | |
| Study Element | Study Element |
| Air Quality | Socioeconomics |
| Environmental Justice | Public and Occupational Safety and Health |
| Waste Management and Hazardous Materials | |

3.12 Cumulative Impacts

The impacts of the original Project generally would be minor and localized, and the DOE focused its EA evaluation of cumulative impacts of the Project and reasonably foreseeable future actions in Pontotoc, Mississippi. This section provides an update to these reasonably foreseeable actions.

3.12.1 Reasonably Foreseeable Actions

At the time the original EA was prepared, there were two other industrial developments in the vicinity of the project. Both of these developments have proceeded approximately as projected in the original EA.

The approximately 300-acre (120-hectare) Three Rivers Industrial Site immediately adjacent to the original site now contains the modified site. Enerkem's biorefinery would be the first tenant of this Industrial Site. Marketing efforts are ongoing, additional clients are expected, and the remainder of the site is expected to be converted to a more industrial character over the next 2 to 10 years.

The new Toyota Plant located just west of Blue Springs, Mississippi, approximately 10 miles (16 kilometers) northeast of the biorefinery is now in operation. The new plant is located on a 1,700-acre (690-hectare) site adjacent to I-22 (US 78), a limited access four-lane highway from Memphis, Tennessee to Birmingham, Alabama. The plant opened on November 17, 2011 (Toyota, 2011), and approximately 2,000 people are employed at the plant site (Toyota, 2012).

3.12.2 Cumulative Impacts Summary

The reasonably foreseeable actions anticipated in the original EA have developed approximately as projected, and the potential cumulative impacts of the modified Project on the natural and human environment have not changed from those projected in the original EA. Therefore, the existing EA adequately evaluated the potential cumulative impacts of the Project.

4.0 Conclusions and Determination

The potential environmental impacts of the modified Proposed Project were evaluated as discussed in the above sections. Based on the comparisons included above the following conclusions can be drawn:

- The potential environmental impacts from the modified Proposed Project are within range of those presented in the original EA
- The potential environmental impacts from the modified Proposed Project are within those identified in the FONSI

Determination:

The Department has determined that the Proposed Action does not constitute a substantial change in actions previously analyzed and would not present any new circumstances or information relevant to the environmental concerns and bearing on the previously analyzed actions or impacts, within the meaning of 40 CFR § 1502.9(c) and 10 CFR § 1021.314. Accordingly, the Department has determined that a further supplement to the EA is not required.

5.0 References

Beraneck, L.L., and I.L. Ver. 1992. Noise and Vibration Control Engineering. John Wiley & Sons Inc. Center for Transportation Research, Argonne National Laboratory. 2007. "Life-cycle energy and greenhouse gas emission impacts of different corn ethanol plant types." IOP Electronic Journals. http://www.iop.org/EJ/article/1748-9326/2/2/024001/erl7_2_024001.html

Cook Coggin Engineers, Inc. 2010. Traffic Impact Analysis. Enerkem Bio-Fuel Development on Beulah Grove Road (CR 267), Pontotoc County, Mississippi. June 2010.

Department of Energy (DOE). 2010. Final Environmental Assessment. Construction and Operation of a Heterogeneous Feed Biorefinery. Enerkem Corporation. DOE/EA-1790.

Eaton, Stuart. 2000. Worker's Compensation Board of BC. Construction Noise - ARCS Reference No: 0135-20.

Jones & Stokes Associates, Inc. 1999. California State Water Resources Control Board - General Waste Discharge Requirements for Biosolids Land Application, Draft Statewide Program EIR; Appendix G. Background Information on Acoustics. Accessed June 2010 at http://www.swrcb.ca.gov/water_issues/programs/biosolids/deir/appendices/app_g.pdf

Mississippi Department of Environmental Quality, Office of Land and Water Resources, Groundwater Planning and Protection Division, Records of Public-Supply Wells in Mississippi, 2009, dated May 22, 2009, reviewed online at: [http://www.deq.state.ms.us/mdeq.nsf/pdf/GPB_MissPublicSupplyWells2009/\\$FILE/records%20of%20public-supply%20wells%20in%20mississippi%202009.pdf?OpenElement](http://www.deq.state.ms.us/mdeq.nsf/pdf/GPB_MissPublicSupplyWells2009/$FILE/records%20of%20public-supply%20wells%20in%20mississippi%202009.pdf?OpenElement)

Natural Resources Conservation Service (NRCS) "Web Soil Survey." Accessed May 2010 at <http://websoilsurvey.nrcs.usda.gov/app/websoilsurvey.aspx>.

Schultz, Theodore J. "Synthesis of Social Surveys on Noise Annoyance," Journal of the Acoustical Society of America 64 (August 1978): 377-405.

Toyota. 2011. News Releases. Toyota Begins Corolla Production in Mississippi (November 17, 2011). Accessed on April 2, 2012, at <http://toyotanewsroom.com/manufacturing+engineering/mississippi/releases/>

Toyota. 2012. News Releases. Toyota Mississippi Begins Second Shift (February 6, 2012). Accessed on April 2, 2012, at <http://toyotanewsroom.com/manufacturing+engineering/mississippi/releases/>

U. S. Environmental Protection Agency (EPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. EPA/ONAC 550/9-74-004, March 1974.

U.S. Fish & Wildlife Service (USFWS). 2010. Threatened and Endangered Species of Mississippi. Accessed on August 13, 2010, at http://ecos.fws.gov/tess_public/countySearch!speciesByCountyReport.action?fips=28115

USGS, 2002, Ground-Water Quality Beneath an Urban Residential and Commercial Area, Montgomery, Alabama, 1999 – 2000, Water-Resources Investigations Report 02-4052, dated 2002, reviewed online at: <http://pubs.usgs.gov/wri/wri024052/pdf/wri02-4052.pdf>

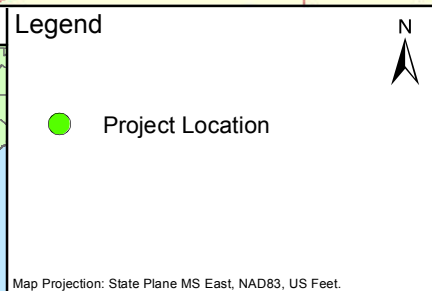
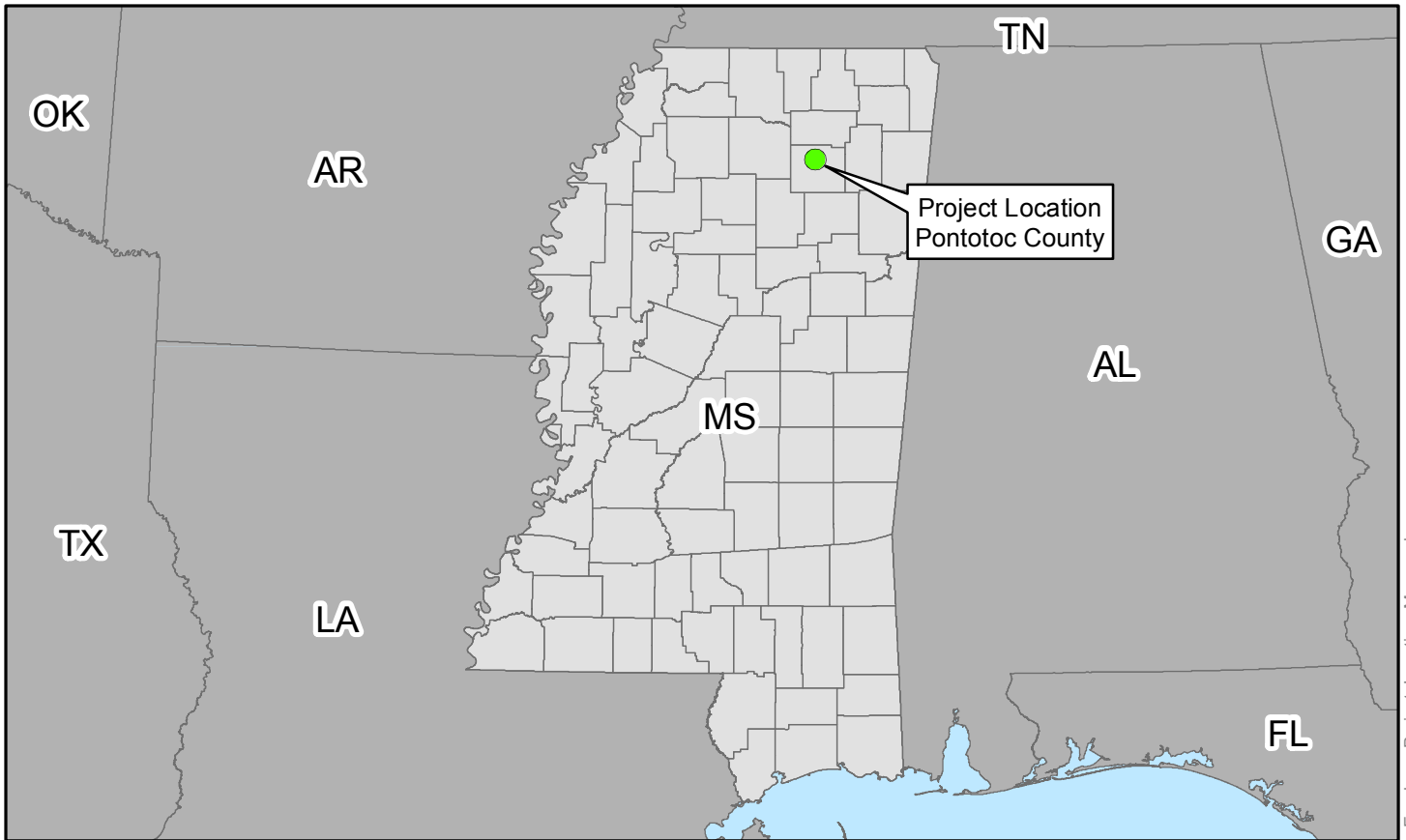
6.0 Acronyms, Abbreviations, and Terms

| | |
|------------------|---|
| ASU | air separation unit |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| CO ₂ | carbon dioxide |
| dB | decibel |
| dBA | decibels, A-weighted scale |
| DOE | U.S. Department of Energy |
| EA | Environmental Assessment |
| EPA | U.S. Environmental Protection Agency |
| FONSI | Finding of No Significant Impact |
| GHG | greenhouse gas |
| GSR | gasifier solid residues |
| HAP | hazardous air pollutant |
| HDD | Horizontal Directional Drilling |
| Industrial WWTP | Pontotoc County Industrial Park Waste Water Treatment Plant |
| Ldn | Day-night average sound level |
| MDAH | Mississippi Department of Archives and History |
| MDEQ | Mississippi Department of Environmental Quality |
| MDWFP | Mississippi Department of Wildlife, Fisheries, & Parks |
| MRF | Materials Recovery Facility |
| MSW | municipal solid waste |
| N ₂ O | nitrous oxide |
| NO _x | nitrogen oxides |
| NEPA | National Environmental Policy Act |

| | |
|------------------|---|
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| NSA | Noise Sensitive Area |
| O ₂ | oxygen |
| O ₃ | ozone |
| Pb | lead |
| PEPA | Pontotoc Electric Power Association |
| PM | particulate matter |
| PM ₁₀ | particulate matter of ≤10 microns |
| Pontotoc WWTP | City of Pontotoc Waste Water Treatment Plant |
| RDF | Refuse-Derived Fuel |
| SA | Supplement Analysis |
| SF | square feet |
| SO ₂ | sulfur dioxide |
| SO _x | sulfur oxides |
| SPL | Sound Pressure Level |
| Syngas | Synthetic Gas |
| TRSWMA | Three Rivers Solid Waste Management Authority |
| TWE | Tippah-Providence-Wilcox soil association |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish & Wildlife Service |
| VOC | volatile organic compound |
| WWTP | Waste Water Treatment Plant |

Appendix A

Supplement Analysis Figures



Enerkem Heterogeneous Feed Biorefinery Project Modification
 Pontotoc, Mississippi

Project Location



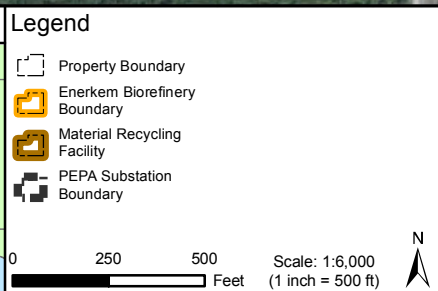
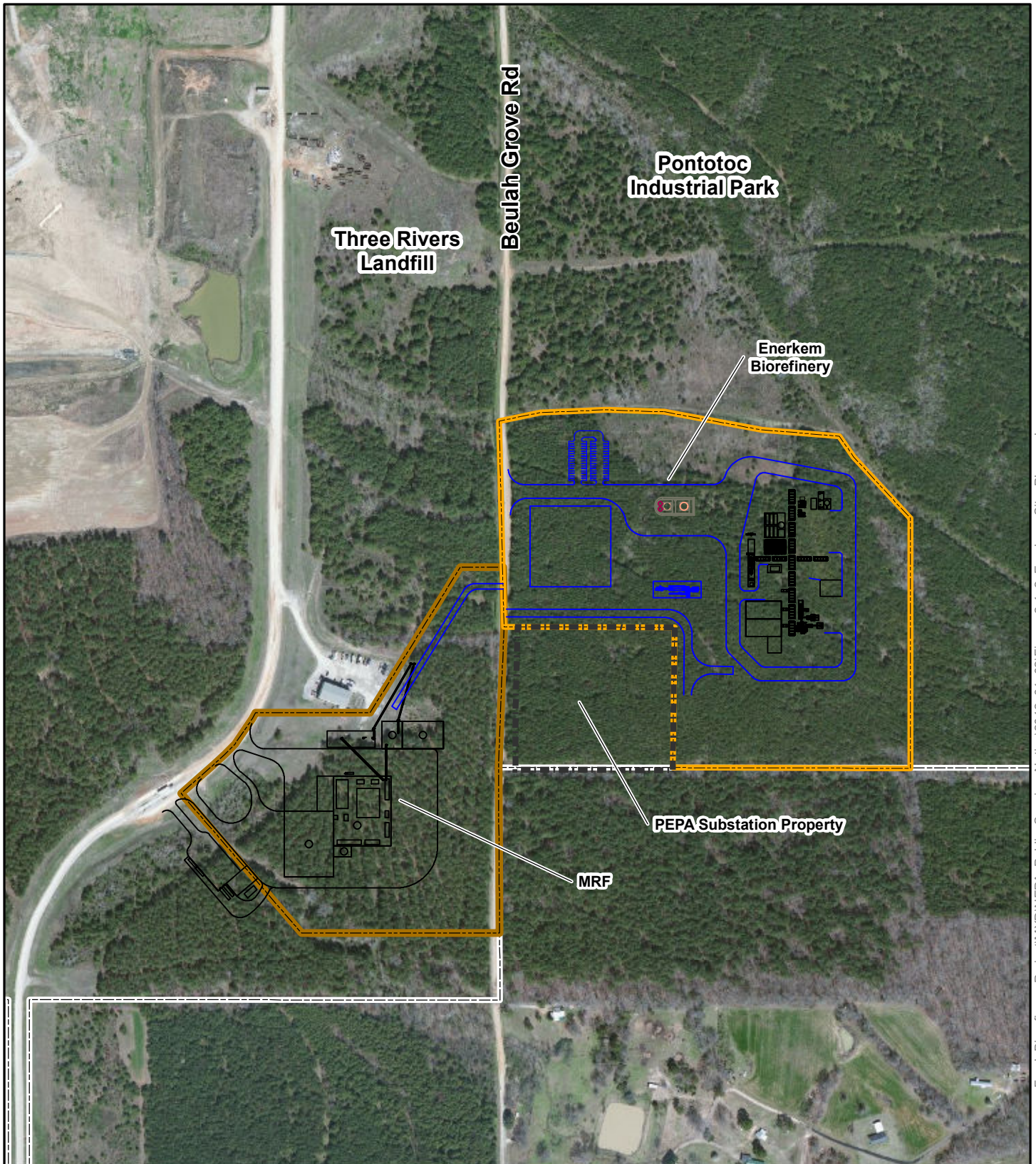



Figure 2.1-1
 April 2012
 Project #: 60250047

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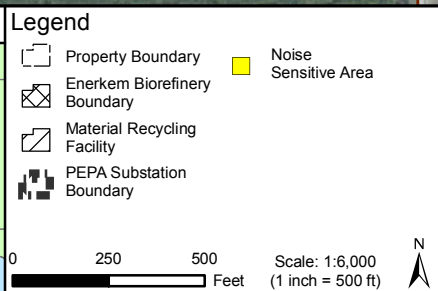


Enerkem Heterogeneous Feed Biorefinery Project Modification
Pontotoc, Mississippi

Site Plan

Image Source: ESRI - Microsoft Virtual Earth Imagery.
 Map Projection: State Plane MS East, NAD83, US Feet.

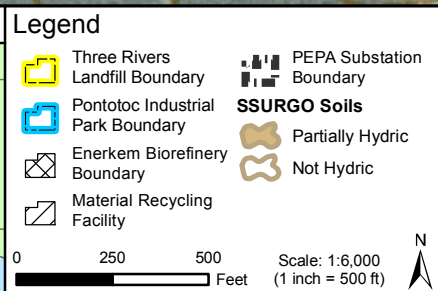
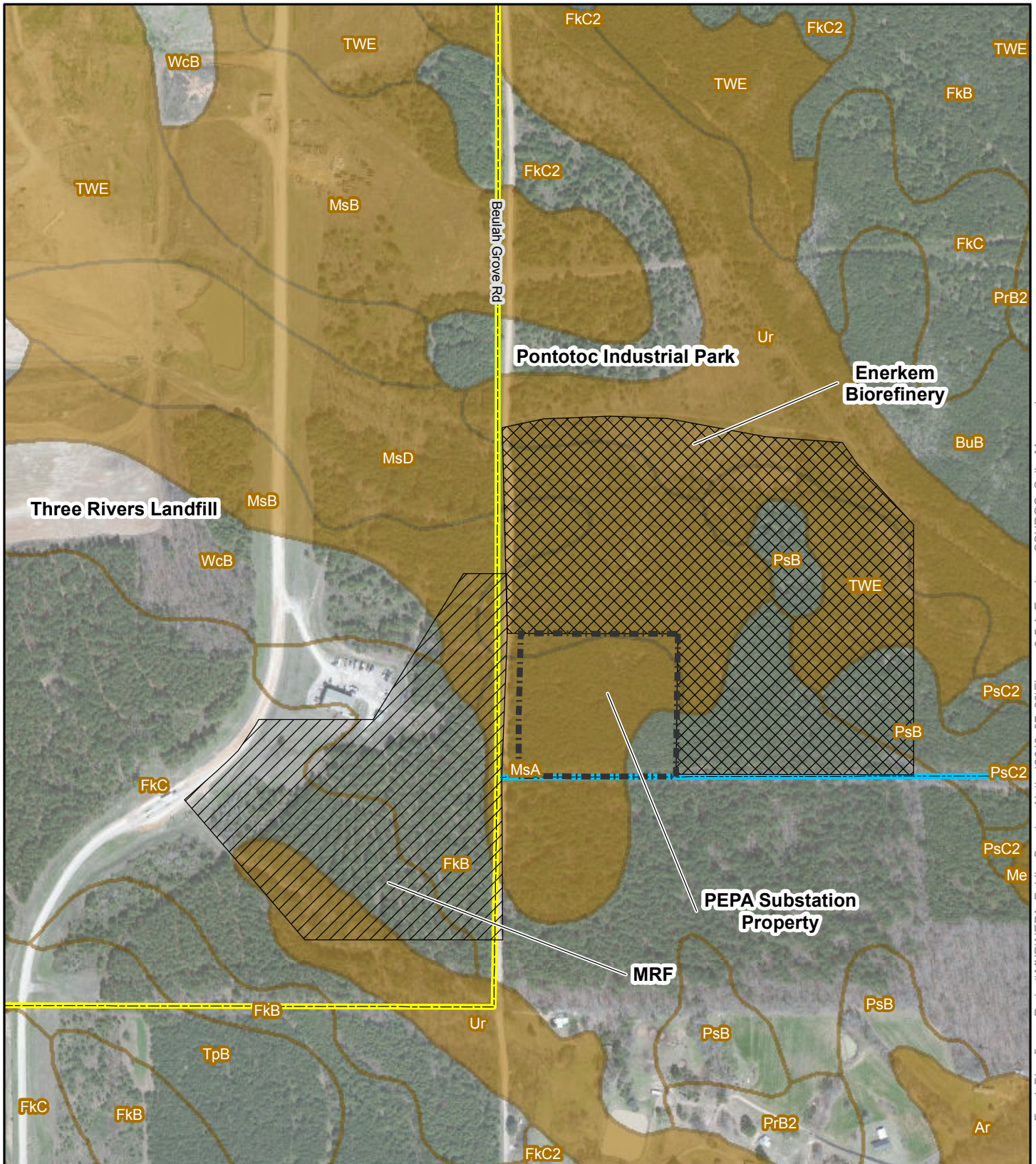
Figure 2.1-2
 April 2012
 Project #: 60250047



**Enerkem Heterogeneous Feed
Biorefinery Project
Modification**
Pontotoc, Mississippi

Land Use

Figure 3.1-1
April 2012
Project #: 60250047



Enerkem Heterogeneous Feed Biorefinery Project Modification
 Pontotoc, Mississippi
 Soil Survey Geographic Database Soils

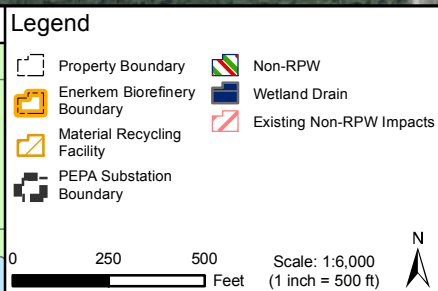
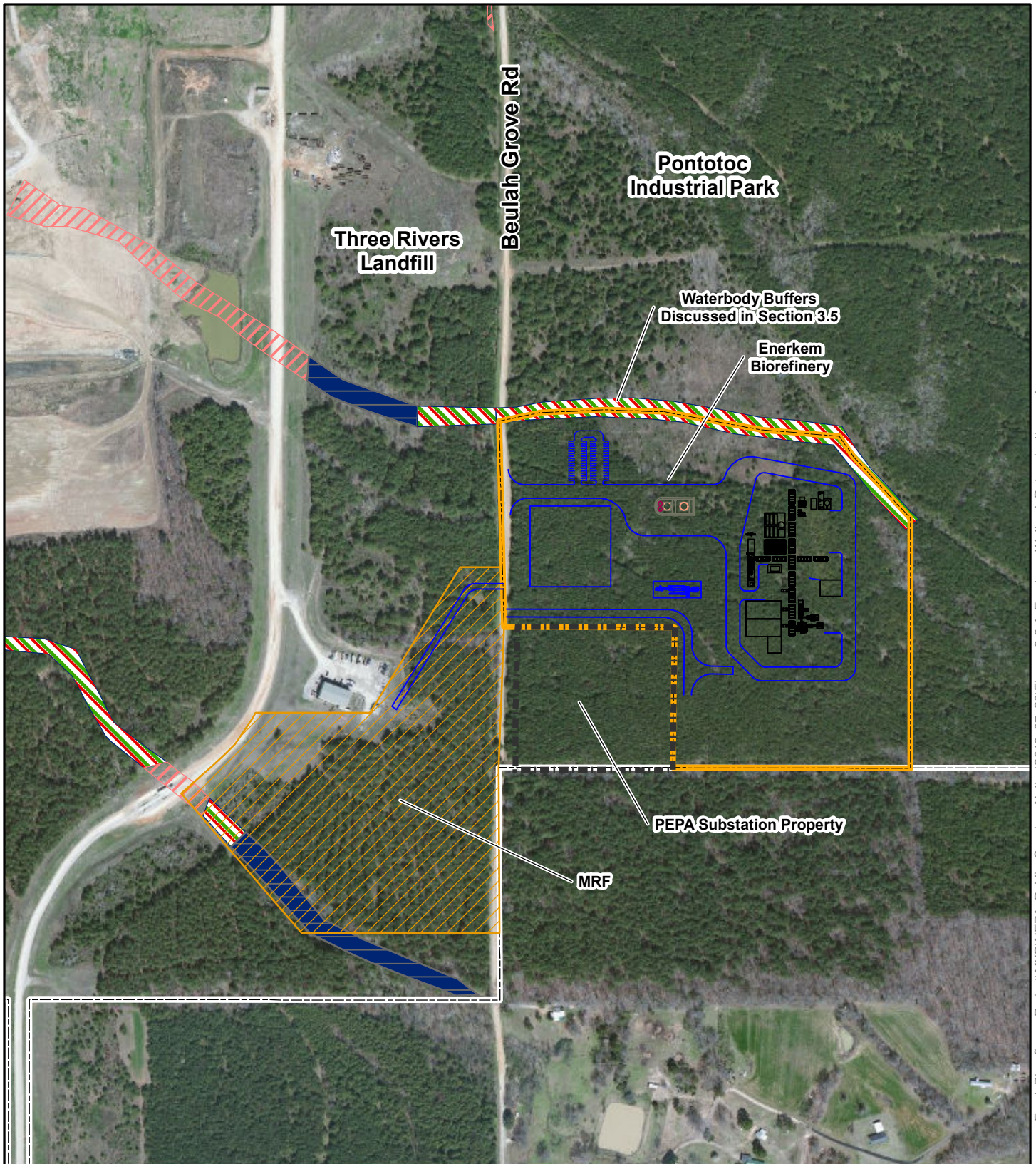
Image Source: ESRI - Microsoft Virtual Earth Imagery.
 Map Projection: State Plane MS East, NAD83, US Feet.

Enerkem

AECOM

Figure 3.4-1
 April 2012
 Project #: 60250047

Z:\GIS\Projects\E\Enerkem\Heterogeneous_Feed_Biorefinery_Project\MXD\NEPA_Public_Scoping_Notice\2010_07_20\Figure_3-5-1_Enerkem_SSURGO_Soils_Map.mxd



Enerkem Heterogeneous Feed Biorefinery Project Modification
Pontotoc, Mississippi

Wetland Delineation

Image Source: ESRI - Microsoft Virtual Earth Imagery.
 Map Projection: State Plane MS East, NAD83, US Feet.

Figure 3.5-1
 April 2012
 Project #: 60250047

Appendix B

Correspondence



PO Box 571, Jackson, MS 39205-0571
601-576-6850 • Fax 601-576-6975
mdah.state.ms.us
H. T. Holmes, Director

May 8, 2012

Mr. Russ Twitty
FC&E Engineering, LLC
Post Office Box 1774
Brandon, Mississippi 39043

RE: Proposed construction of an ethanol production plant in S24, T9S, R2E by
Enerkem Mississippi Biofuels, MDAH Project Log #04-030-12, Pontotoc County

Dear Mr. Twitty:

We have reviewed your request for a cultural resources assessment, received on April 6, for the above referenced project in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. After reviewing the information provided, it is our determination that no cultural resources are likely to be affected. Therefore, we have no objection with the proposed undertaking.

Should there be additional work in connection with the project, or any changes in the scope of work, please let us know in order that we may provide you with appropriate comments in compliance with the above referenced regulations.

If you have any questions, please do not hesitate to contact us at (601) 576-6940.

Sincerely,

A handwritten signature in black ink that reads "Hal Bell". The signature is written in a cursive style with a large, prominent "H" and "B".

Hal Bell
Review and Compliance Assistant

FOR: Greg Williamson
Review and Compliance Officer