

Chapter 6

**Best Management Practices
and Mitigation**

CONTENTS

<u>Section</u>	<u>Page</u>
6 Best Management Practices and Mitigation.....	6-1
6.1 Best Management Practices.....	6-1
6.2 Mitigation	6-5

LIST OF TABLES

<u>Table</u>	<u>Page</u>
6-1 Best management practices under consideration.....	6-1
6-2 Mitigation measures under consideration	6-6

6. BEST MANAGEMENT PRACTICES AND MITIGATION

This chapter describes measures to *mitigate* adverse environmental impacts from the construction and operation of the *biorefinery* under either the *Proposed Action* or Action Alternative. The U.S. Department of Energy (DOE or Department) will consider these measures in deciding in its *Record of Decision* whether to provide federal funds for the design, construction, and startup of the biorefinery.

6.1 Best Management Practices

The measures comprise two categories: *best management practices* and mitigation measures. For the purposes of this Abengoa Biorefinery Project EIS, best management practices are defined as the practices, techniques and methods, and processes and activities commonly accepted and used throughout the construction and ethanol and energy production industries to facilitate compliance with applicable requirements, and that provide an effective and practicable means of avoiding or reducing the potential environmental impacts of the Proposed Action and Action Alternative (described in Chapter 4). Best management practices are integral to the design, construction, and operation of the biorefinery, and thus are incorporated into the description of the Proposed Action and Action Alternative (see Chapter 2). In general, best management practices include actions taken in compliance with other government agency regulations, stipulations, or guidance; coordination with other agencies and interested parties; implementation of Departmental policies and orders; implementation of industry practices and policies; and monitoring of relevant ongoing or future activities. Table 6-1 lists best management practices under consideration by DOE.

Table 6-1. Best management practices under consideration.

Land use
<ul style="list-style-type: none"> • Reclaim lands disturbed during the construction process. • Restore disturbed areas to their approximate condition before construction. • Abide by relevant zoning regulations. • Select non-irrigated, marginal land near a major road for biomass satellite storage locations. This would avoid taking highly productive land out of production. Targeted land would not include prime farmland or land enrolled in the Conservation Reserve Program. • Target feedstocks commonly available within the region of influence through biomass purchase contracts. • Target highly productive land with limited soil resource concerns. • Consult with public and private stakeholders to identify and develop alternative feedstocks suitable to growing conditions within the region of influence. • Harvest feedstock in accordance with Natural Resources Conservation Service guidelines to minimize soil erosion potential. • Harvest feedstock in a manner conducive to minimizing soil compaction and preserving soil integrity. • Make a nutrient replacement program available to the feedstock producer. The voluntary nutrient replacement program provides a method for feedstock producers to replace soil nutrients removed through feedstock harvesting. The voluntary program would not require feedstock producers to use Abengoa Bioenergy as their nutrient replacement source.

Table 6-1. Best management practices under consideration (continued).

Air quality
<ul style="list-style-type: none"> • Reduce fugitive dust emissions during construction using control measures such as water spraying, chemical treatment, and wind fences. • Reduce fugitive dust emissions during construction using control measures such as limiting activities in areas not being used for construction and the number of locations to access construction areas and staging construction activities to avoid simultaneous dust-generating activities. • Pave in-plant haul roads and post a maximum speed limit of 15 miles per hour (24 kilometers per hour) to control particulate matter, PM₁₀, and PM_{2.5}. Additional maintenance such as sweeping and watering the paved roads also would provide control for particulate matter. • Reduce particulate matter, PM₁₀, and PM_{2.5} fugitive emissions from unpaved biomass laydown roads through the use of chemical stabilization and wind fences. • Reduce particulate matter, PM₁₀, and PM_{2.5} emissions in the onsite biomass handling and milling systems, and from the sand and ash handling systems by using dust collectors (baghouses). • Increase capture efficiency of particulate matter, PM₁₀, and PM_{2.5} emissions resulting from the biomass grinding process by maintaining negative pressure in the enclosed grinding systems. • Install and operate high-efficiency wet scrubbers on biomass fermentation and distillation operations for volatile organic compound and hazardous air pollutant control. • Install and operate condensers on biomass process vents for volatile organic compound control. • Reduce nitrogen oxide emissions from the mixed-fuel boilers by utilizing a selective non-catalytic reduction system. • Equip ethanol and denaturant storage tanks with internal floating roof designs to control volatile organic compound and hazardous air pollutant emissions. • Route emissions from ethanol loadout to a vapor recovery system for volatile organic compound and hazardous air pollutant control. • Control equipment leaks that would result in emissions of fugitive volatile organic compounds and hazardous air pollutants through the use of a leak detection and repair protocol.
Geology and soils
<ul style="list-style-type: none"> • Minimize wind and water erosion of soils during and after construction by wetting for dust control during soil disturbance, timely reclamation of disturbed areas, and adherence to requirements established in a storm water pollution prevention plan.
Surface water
<ul style="list-style-type: none"> • Conduct a wetland survey and assessment on the suspect wetland area within the buffer area and submit to the Kansas State Regulatory Office of the Corps of Engineers for their concurrence or comment. • Prepare, submit, and implement a storm water pollution prevention plan for construction activities to minimize soil loss during storm events.

Table 6-1. Best management practices under consideration (continued).

<ul style="list-style-type: none"> • Implement erosion and sediment control measures during construction, such as: <ul style="list-style-type: none"> - Construct access control measures to minimize the amount of area disturbed; - Cut and fill slopes in a manner that minimizes erosion; - Use sediment control measures such as silt fences or straw bale barriers; and - Protect culverts from unfiltered or untreated runoff. • Use secondary containment for bulk fuel storage tanks and for the chemical storage area. • Use double-walled fuel tanks for emergency generators. • Construct the tank loading and unloading area and the anhydrous ethanol process areas with trench drains that discharge to a concrete containment basin. • Develop a spill prevention and countermeasures control plan for petroleum products and other hazardous materials to identify equipment necessary to respond to spills; include procedures to identify federal, state, and local notification requirements should a reportable release occur; and identify appropriate cleanup actions.
<hr/> <p>Groundwater</p> <hr/>
<ul style="list-style-type: none"> • Implement water supply line leak detection inspections as part of routine operation and maintenance program to prevent system losses, and thereby minimize groundwater use. • Meter groundwater use to ensure compliance with established limits. • Prepare a conservation management plan for application of non-contact waste to the buffer area to preclude waste of water and attain maximum beneficial reuse of wastewater. The plan should include, but not be limited to, a means to minimize soil erosion, manage soil nutrients, establish irrigation application rates based on types of vegetation and their moisture requirements, and identify the mechanics of applying the wastewater.
<hr/> <p>Biological resources</p> <hr/>
<ul style="list-style-type: none"> • Provide development plans for the off-site biomass storage locations to the Kansas Department of Wildlife and Parks, U.S. Fish and Wildlife Service, and Oklahoma Department of Wildlife and Parks to ascertain whether these locations would affect high-quality native prairie, known lesser prairie chicken leks, black-tailed prairie dog colonies, or any designated critical habitats for threatened and endangered species.
<hr/> <p>Utilities, energy, and materials</p> <hr/>
<ul style="list-style-type: none"> • Implement procedures and equipment that would minimize the use of utility services, energy, and materials. • Notify potentially affected utility owners prior to construction and coordinate with the owners to avoid or minimize impacts to utilities. Contact Kansas One-Call prior to any excavation associated with construction of the biorefinery. • Minimize disturbance around areas of underground utilities. Ensure that work crossing any buried utility line would not be started until material and equipment were available for immediate use. Complete work as quickly as possible; keep exposure of existing utilities to a minimum and surround the utility line with appropriate backfill material.
<hr/> <p>Wastes and hazardous materials</p> <hr/>
<ul style="list-style-type: none"> • Provide ash from the solid biomass boiler to biomass producers (as part of a voluntary program) for use as a soil amendment (beneficial byproduct) for nutrient replacement.

Table 6-1. Best management practices under consideration (continued).

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- Recover and sell lignin as a beneficial byproduct (e.g., replacement for phenol as a wood binder).
 - Manage excess construction materials to minimize generated waste. Excess construction materials would be returned to vendors, retained for future use, or transferred in settlement with subcontractors.
 - Recycle construction material waste, as feasible, to reduce solid waste disposal.
 - Recycle captured process solids through the solid biomass boiler for energy recovery.
 - Dispose non-recycled solid wastes from construction and facility operations in permitted solid waste disposal facilities in Kansas.
 - Store, transfer, and dispose of hazardous wastes generated during biorefinery operations in accordance with state and federal regulations.
 - Recover and recycle process wastewater treated onsite and reuse in the production process. Non-contact wastewater and wastewater treatment plant sludge would be land-applied.
 - Conduct an agronomy study to assess the impacts to soil and vegetation due to application of non-contact wastewater and wastewater treatment facility sludge on the buffer area.
 - Adhere to manufacturer guidelines regarding the handling, storage, and application of herbicides, pesticides, and rodenticides used to maintain the biorefinery.
 - Adhere to state and federal regulations when handling, storing, or disposing of (shipping offsite for disposal) hazardous materials/wastes.

Visual resources

- Decrease visual obscuration caused by fugitive dust emissions during construction by using control measures such as water spraying, chemical treatment and wind fences.
- Reduce visual obscuration caused by fugitive dust emissions from roads during operation by chemical stabilization, water spraying, and posting low speed limits.
- Control visible emission plumes by maintaining no more than a 20 percent opacity limit.

Noise

- Construction
 - Control noise at the source whenever possible.
 - Use appropriate silencing equipment for construction equipment.
 - Select quietest working equipment available, such as electric/battery-powered equipment, which is generally quieter than diesel-powered equipment.
 - Position equipment behind physical barriers or provide lined and sealed acoustic covers for equipment that could potentially contribute to a noise nuisance.
 - Shut down equipment when not in use and maintain no idling policy.
 - Switch all audible warning systems to the minimum setting.
 - Confine construction activities to normal working hours to the extent possible.
 - Use noise abatement measures for construction during nighttime hours, e.g. silencers on equipment and tools, sound barriers, and avoidance of noisy work outside of buildings.

Table 6-1. Best management practices under consideration (continued).

- Employ proper hearing protection for workers when needed.
- Operations
 - Employ proper hearing protection for workers when needed.
 - Post signs indicating where hearing protection is needed.
 - Implement hearing conservation program, engineering controls (e.g. silencers, sound barriers, acoustic panel enclosures), and/or provide personal protective equipment as needed.

Odor

- Reduce odorous emissions through the use of equipment that controls volatile organic compounds and hazardous air pollutants. Control equipment includes wet scrubbers on fermentation and distillation systems and floating internal roof designs on ethanol storage tanks.

Cultural resources

- Cease construction should buried cultural resources be exposed by trenching or below-grade excavation until such time as a qualified archaeologist examines the resources and the Kansas State Historical Society is notified.
- Provide development plans for the off-site biomass storage locations to the Kansas State Historical Preservation Office to ascertain the potential for these locations to contain significant cultural resources. If the potential is deemed to be relatively high, follow protocols of the Office to determine whether the resources require further investigation, are potentially eligible for inclusion on the National Historic Register or State Historical Register, or whether other locations should be considered for biomass storage.

Health and safety

- Comply with safety and health regulations during the construction process. These steps include, but are not limited to, instructing employees in the recognition and avoidance of unsafe conditions, keeping debris cleared from work areas, wearing appropriate personal protective equipment, maintaining equipment in proper working condition, having fall protection systems in place, and using appropriate signage to warn of dangers and potential hazards.
- Develop operating procedures to ensure compliance with regulatory requirements and which provide consistency throughout the facility to minimize confusion and possible errors.
- Perform process hazard analyses on those tanks within the facility that may contain more than 10,000 pounds (4,536 kilograms) of flammable liquid. The purpose of the analyses would be to identify possible deviations from process design or operations that could cause injury to personnel, or could adversely affect the public. The analyses would then develop recommendations to further reduce the likelihood of an accident or to reduce the possible severity of an accident if it were to occur.
- Establish administrative limits to restrict the amount or concentration of regulated chemical substances to meet compliance requirements. This includes (1) maintaining the chemical supply at 19 percent aqua ammonia or less or if greater than 19 percent, limiting total storage quantity to 20,000 pounds (9,072 kilograms) of solution, and (2) using denaturant that is rated 3 or lower by the National Fire Protection Association or limiting total storage quantity to 10,000 pounds (4,536 kilograms).

6.2 Mitigation

Mitigation measures are defined by the Council on Environmental Quality regulations (Title 40 of the Code of Federal Regulations 1508.20) as:

“(a) Avoiding the impact altogether by not taking a certain action or parts of an action

- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- (e) Compensating for the impact by replacing or providing substitute resources or environments.”

DOE regards mitigation measures as activities or actions that would be above and beyond (in addition to) best management practices and, therefore, does not include them in the Proposed Action and Action Alternative (or the corresponding environmental impact analyses of Chapter 4). Table 6-2 lists mitigation measures under consideration by DOE for the Proposed Action and Action Alternative.

Table 6-2. Mitigation measures under consideration.

Air quality
<ul style="list-style-type: none"> • Use well-maintained construction equipment having appropriate emissions controls.
Visual resources
<ul style="list-style-type: none"> • Maintain the current visual status of the buffer area over time by only utilizing the land in the buffer area for agricultural activities. • Reduce the impacts from night lighting at the biorefinery by using downward-facing or directional lighting and the minimum amount of lighting needed for safe operation.
Odor
<ul style="list-style-type: none"> • Control odorous emissions through the use of an odor control plan, which would identify sources of odorous emissions, controls used on those sources, operation and maintenance plans with schedules for routine maintenance of the control equipment, and a response plan if any of the control equipment fails to meet specifications. The operation and maintenance plans and schedules would be evaluated and updated over time to ensure improvements are recognized and incorporated as appropriate.
Socioeconomics
<ul style="list-style-type: none"> • Initiate timely communication with local and regional organizations to disseminate information relative to the construction schedule and expected worker influx to assist in planning for increased demand on community services.
Wastes and hazardous materials
<ul style="list-style-type: none"> • Develop a waste management and pollution prevention plan prior to contracting facility construction. • Identify landfills for the disposal of solid and industrial wastes during construction and operation of the biorefinery. Construction specifications should direct contractors where to recycle/dispose construction generated wastes.
Transportation
<ul style="list-style-type: none"> • Stagger workforce schedules to minimize traffic delays and congestion on nearby roadways. • Develop safety-based criteria to be used, in part, to select carriers (truck). Criteria should include elements of the Federal Motor Carrier Safety Administration regulations (see next bullet), as well as provisions for drivers to be paid hourly and receive bonuses for accident-free driving, mandatory safety training, and avoidance of teen-age drivers and drivers having less than 5-years experience.

Table 6-2. Mitigation measures under consideration (continued).

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- Require carriers and drivers to meet the Federal Motor Carrier Safety Administration regulations that establish: commercial driver license standards, requirements, and penalties; general qualifications for drivers and rules for driving a commercial motor vehicle: hours of service limits for drivers; safety fitness standards; motor carrier safety regulations; minimum levels of financial responsibility for motor carriers; requirements to test drivers for controlled substance and alcohol use; and driver training requirements.
 - Require safety training protocols/programs for selected carriers.
 - Ensure the onsite rail system is sufficient to handle unit trains without blocking railroad crossings near the *Biorefinery Project site* for long periods of time.
 - Maximize the use of rail for shipments to and from the Project site.
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