

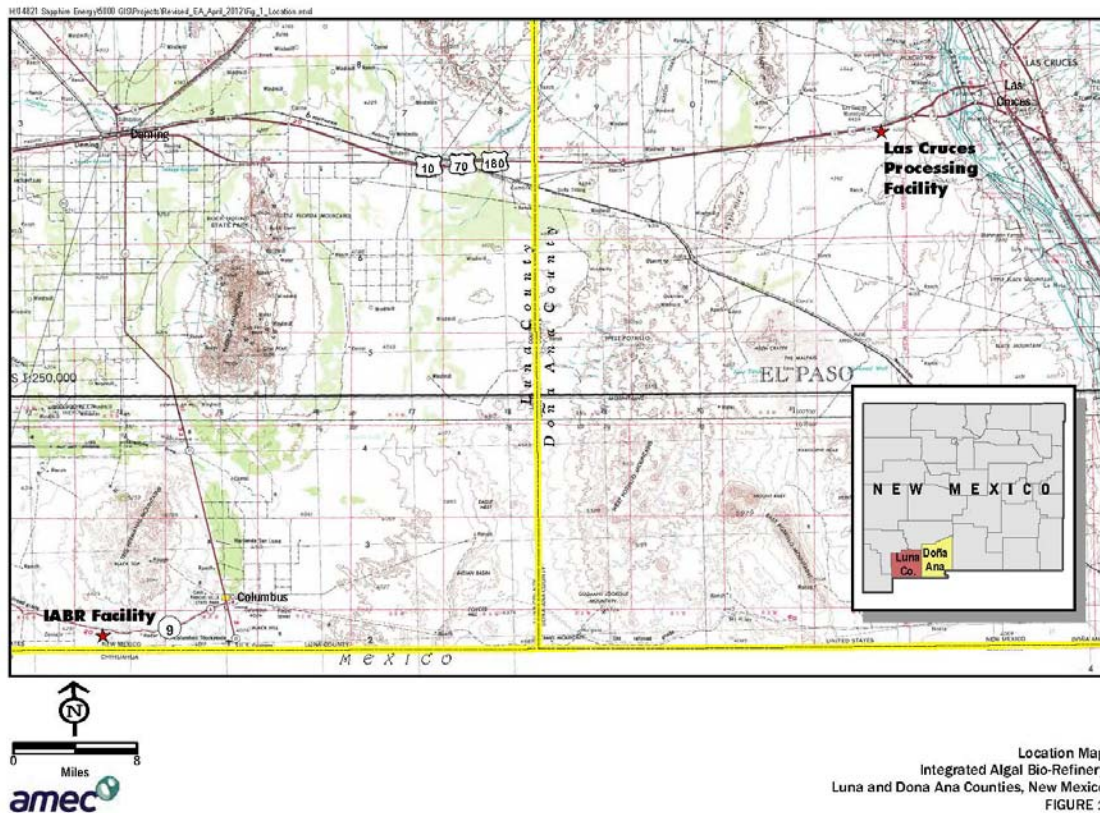
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT  
SAPPHIRE INTEGRATED ALGAL BIO-REFINERY (IABR) FACILITY  
Columbus, New Mexico

**Summary**

Sapphire Energy, Inc. (Sapphire) proposes to temporarily modify the Operational Plan for the Integrated Algal Bio-Refinery (IABR) Facility located near Columbus, Luna County, New Mexico by temporarily utilizing their Pilot Processing Plant located in Las Cruces (Las Cruces Plant), Dona Ana County, New Mexico for the oil extraction process. An Environmental Assessment (EA) was prepared in 2009 (USDA 2009), describing the IABR Facility's proposed demonstration scale project and identifying potential impacts related to the construction of the IABR facility.

The United States Department of Agriculture, Rural Business-Cooperative Service (USDA RBS) has determined that the proposed changes in the project description, as overviewed in this EA Supplement, will result in no significant impact to the human environment and that the Finding of No Significant Impact (FONSI) for the original EA is valid. Below is a description of this analysis.

**Figure 1 Location Map of IABR and Las Cruces Sites.**



## **Revised Project Description**

Sapphire is proposing to temporarily modify the original Operational Plan for the IABR facility to include:

- 1) Temporary suspension of oil extraction at the IABR facility in order to perform temporary oil extraction at an existing Pilot Processing Plant in Las Cruces New Mexico.
- 2) Modification of the existing equipment and construction of new equipment at the Las Cruces Pilot Plant (**Figure 1**) within areas previously disturbed by the original Plant construction.
- 3) Shipment of dewatered algal biomass from the IABR facility to the Pilot Processing Plant in Las Cruces;
- 4) Transportation of solid and liquid wastes from the Las Cruces Plant back to the IABR Facility; and
- 5) Shipment of extracted oil via tanker trucks from the Las Cruces Plant to a rail loading facility located in Las Cruces for shipment to a refinery for conversion into liquid fuels.

Sapphire's Pilot Processing Plant was built in 2008 and is located at 9035 Advancement Avenue, Las Cruces NM 88007. The Pilot Plant is approximately 18 acres in size, and operates as a biorefinery research and development center. Sapphire proposes to install supplemental equipment at the Plant in order to temporarily extract oil from algae biomass. The Pilot Plant would need approximately 2,000 square feet in of additional area within the existing 18 acre site order to install the equipment. This equipment is proposed to be installed near existing structures and other site infrastructure. Under this modification, operations at the IABR Facility and oil extraction operations at the Las Cruces Pilot Plant would occur for a three to five-year test period beginning in 2012, as described in the original EA.

This modification proposes no change to the Operational Plan for algal growth and harvesting at the IABR Facility as reviewed in the EA, other than other than the transport of dewatered algae to the Las Cruces Plant for oil extraction, the location of oil extraction at an offsite Plant, the subsequent origination location for shipment of algal oil from a rail loading facility, and the recycling a smaller amount of wastewater back into the system. Since a portion of water would be taken out of the system during the oil extraction process and left at the Las Cruces Plant, the amount of water recycled back into the system at the IABR Facility for algal growth would be smaller

## **Transportation**

Dewatered algae would be transported via 5,000-gallon tank trucks from the IABR Facility to the Las Cruces Plant for oil extraction. It is estimated that 7 tanker truck loads per day would be used to transport dewatered algae oil from the IABR Facility to Las Cruces and 7 tanker truck loads per day would be used to transport waste and algae inoculum from Las Cruces back to the IABR Facility. Therefore, this modification proposes a cumulative increase of 14 trips (or 7 round trips) per day from the original Operational Plan. Transportation to and from the Project sites would occur along existing roads and infrastructure.

This modification proposes a cumulative increase of 14 one way trips per day along existing state highways and roads/infrastructure, within areas that are already operating in an industrial use. This increased amount of traffic is not expected to have a significant impact on traffic patterns and is not expected to have a significant impact to air quality from the additional expenditure of fossil fuels and exhaust generation.

### **Air Quality**

There are No Class 1 air quality airsheds (pristine quality airshed) located within 100 miles of either Project sites. Air impacts associated with the IABR Facility and the Las Cruces Plant will be within guidelines included in New Mexico's air quality implementation plan and will comply with air quality standards within the region, including those administered by the government of Mexico. An air permit for the IABR Facility and the Las Cruces Plant will be obtained, if necessary, under New Mexico's Air Quality Control Act.

At the present time, a No Permit Required determination has been made by NMED for air quality regarding the Pilot Processing Plant at Las Cruces. Under the proposed modification to the Operational Plan, with an increased volume of oil extraction, the Las Cruces Plant would require a reassessment of air quality permit needs. If changes to the processing plant at Las Cruces result in increased emissions to air of criteria pollutants or Hazardous Air Pollutants (HAPS), such as hexane, in excess of de-minimus thresholds, Sapphire will apply to NMED for a New Source Permit, and for a Clean Air Act (CAA) Title V Permit only as needed.

This modification does not propose a significant change from the original Operational Plan in emissions affecting air quality and will be monitored under existing state of New Mexico air quality regulations.

### **Land Use/Biological Resources**

This modification in Operational Plan proposes retrofit of existing equipment and installation of new equipment within and adjacent to existing infrastructure at the existing Las Cruces Plant. There is no new road construction, and traffic patterns would not be significantly disrupted. The revised footprint for equipment expansion would not substantially increase the existing area of disturbance for the site. There are no known biological resources located within the existing area of disturbance and no land use changes would occur with proposed Project modifications. Based on the scale of proposed site changes and the nature of infrastructure changes (within and near exiting facilities), the Agency has made a finding of no historic properties affected. The Las Cruces Plant is not within the 100-year or 500-year floodplains. For these reasons the proposed modification to the Operational Plan is not expected to have a significant adverse effect to the natural environment or significantly change land use.

Site abandonment and closure activities associated with the IABR Facility will be consistent with the description contained in the original EA for the IABR Facility. Decommissioning and closure of the Las Cruces Plant would be addressed through compliance with state of New Mexico and local requirements.

All solid and liquid waste will be managed at the IABR Facility with the use of an anaerobic digester, as outlined in the original Operational Plan, with the exception of transport of the waste stream from the Las Cruces Plant back to the IABR Facility for recycling.

In conclusion, USDA RBS has not identified any adverse effects to environmental resources imposed by the proposed modification to the Operation Plan outlined in this Supplemental EA.

### **CONCLUSIONS**

- The quantity of algae oil produced will remain the same as in the original EA.
- Waste management practices will remain unchanged as all waste will be transported back to the IABR facility for disposal.
- Water use and water quality will remain the same as in the original EA.
- CO<sub>2</sub> input and consumption will remain unchanged from the original EA.
- This modification does not propose a significant change from the original Operational Plan in emissions that would affect air quality at either site nor during the proposed transport of algae and products and will be monitored under existing state of New Mexico air quality regulations.
- The proposed modification to the Operational Plan is not expected to have a significant adverse effect to the natural environment or significantly change land use, at either site.

Therefore, USDA RBS has determined that this proposed modification will result in no significant impact to the human environment and that the Finding of No Significant Impact (FONSI) for the original EA is valid.

### **REFERENCES**

**U.S. Department of Agriculture. 2009.** Environmental Assessment for Sapphire Energy, Inc. Integrated Algal Biorefinery (IABR) Facility in Columbus, New Mexico. September.