

**FINDING OF NO SIGNIFICANT IMPACT  
COMMERCIAL DEMONSTRATION OF THE MANUFACTURED AGGREGATE PROCESSING  
TECHNOLOGY UTILIZING SPRAY DRYER ASH**

**AGENCY:** U.S. Department of Energy (DOE)

**ACTION:** Finding of No Significant Impact (FONSI)

**SUMMARY:** The DOE has prepared an Environmental Assessment (EA), DOE/EA-1449, to analyze the potential environmental consequences of participating in a cooperative agreement with Universal Aggregates, LLC, for the design, construction, and operation of a plant to manufacture lightweight aggregates. The plant would be located at the Mirant-Birchwood Power Plant Facility (Mirant-Birchwood Facility), about 50 miles north of Richmond, in King George County, Virginia. The Mirant-Birchwood Facility houses a 238 MW<sub>net</sub> cogeneration unit that produces both power and process steam. The proposed project would demonstrate a new technology in support of DOE's Power Plant Improvement Initiative, which targeted new technologies having potential for improving the environmental performance, power generation, and reliability of coal-fired power plants. Demonstration of technology for producing lightweight aggregates from solid waste produced in environmental control technologies used at coal-fired power plants would result in a more cost-effective application of pollution-control technology, thus enhancing the economics of coal-fired power generation.

If approved, the DOE would provide approximately 37% of the estimated \$19.6 million cost of the 30-month project. After the technology demonstration period under the cooperative agreement with the DOE, Universal Aggregates, LLC, would be expected to continue operation of the lightweight aggregate manufacturing plant.

Based on the analysis in the EA, the DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969, 42 United States Code 4321 *et seq.* Therefore, preparation of an Environmental Impact Statement is not required, and DOE is issuing this FONSI.

**COPIES OF THE EA ARE AVAILABLE FROM:**

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**BACKGROUND:** As part of its mission, the DOE's National Energy Technology Laboratory (NETL) provides science, technology, and policy options for resolving environmental, supply, and reliability

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issues associated with the use of fossil energy. Consistent with this mission and in partnership with its stakeholders, NETL supports efforts by industry to increase energy efficiency, minimize wastes, reduce environmental impacts, and increase the availability of domestic energy supplies through productivity and operational enhancements.

To facilitate commercial demonstration of technologies that help maintain coal's viability as a stable domestic resource for power generation, DOE/NETL issued solicitation DE-PS26-01NT41101, "Power Plant Improvement Initiative." Universal Aggregates, LLC, responded with a proposal for "Commercial Demonstration of the Manufactured Aggregate Processing Technology Utilizing Spray Dryer Ash." The proposal from Universal Aggregates offered a new approach for converting the ash generated by spray dryer absorption systems used to control sulfur dioxide emissions into a marketable product. The ash would be manufactured into construction aggregates that could be substituted for crushed stone, sand, gravel, or conventional lightweight aggregates. Products generated from pilot-scale research on this technology have met quality requirements and industry standards for use in construction applications, as determined by the American Society for Testing and Materials and the American Association of State Highway and Transportation Officials. As a result, Universal Aggregates proposed to design, construct, and demonstrate operation of a commercial-size aggregate manufacturing plant at the Mirant-Birchwood Facility. The DOE selected Universal Aggregates' proposal for support.

**DESCRIPTION OF THE PROPOSED ACTION:** The proposed action is for DOE to provide, through a 30-month cooperative agreement, cost-shared financial support for design, construction, and initial operation of the lightweight aggregate manufacturing facility. The proposed technology would transform the 115,000 tons-per-year of spray dryer ash that is currently generated at the Mirant-Birchwood Facility into 167,000 tons-per-year of lightweight aggregate for use in the manufacture of lightweight masonry blocks or lightweight concrete. Under the proposed action, DOE would provide about \$7.2 million (approximately 37% of the total project cost) for the demonstration.

**ENVIRONMENTAL CONSEQUENCES:** The Environmental Assessment included consideration of the following resources: geology and soils, hydrology, cultural resources, ecological resources, threatened and endangered species, water resources, air quality, noise, hazardous wastes, land use, socioeconomic effects, and transportation. The environmental analysis identified that the most notable changes from the proposed action would occur in the areas of truck traffic and diversion of the power plant's existing waste stream from the nearby landfill. No substantive adverse impacts or environmental concerns were identified from analyzing the planned construction and operation of the proposed facility.

*Geology and Soils:* No direct impacts on regional geology and geological resources would be expected due to the small size of the project site (less than 5 acres), the fact that there would be limited aggregate stockpiling, and the fact that there would be no major earthwork required to construct the facility. In addition, because the soil at the proposed project site was disturbed during construction of the Mirant-Birchwood Facility, no major impact on soils would be expected from construction of the aggregate facility.

Spray dryer ash from the Mirant-Birchwood Facility is currently used as a daily cover at the King George Landfill to control disease vectors, fires, odors, and blowing litter. Because the proposed project would use all of the spray dryer ash, the landfill operation would be required to find an alternate cover. Potential indirect impacts to soils from the proposed project could result if the landfill operators disturb additional land to obtain soil materials for use as the daily cover.

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*Hydrology:* The proposed project site is approximately 1,000 feet from a stream that has a riparian buffer zone (Resource Protection Area) established by King George County. However, the proposed project would avoid any significant intrusion into the Resource Protection Area. The riparian buffer zone could mitigate any impact of stormwater runoff to local surface waters. A Stormwater Management Plan, as required by King George County, would be prepared and would include plans for detention facilities to further control runoff. Therefore, no significant impacts would be expected from runoff at the site.

A well would be drilled to supply potable water for the proposed facility; however, the quantity of water withdrawn would be minimal.

*Cultural Resources:* Based on the findings of an archaeological investigation conducted prior to the construction of the Mirant-Birchwood Facility, no historically significant properties would be affected by the proposed project. While two previously identified artifact sites may be impacted by the proposed project, no further archeological investigation would be required due to their compromised integrity and lack of resource potential, and no potentially impacted site could be further developed for the benefit of the public.

*Ecological Resources:* The proposed project site is an abandoned field that is currently vegetated by various grasses and other herbaceous species of low ecological value. No significant impacts to ecological resources would be anticipated.

*Threatened and Endangered Species:* The preferred or critical habitats of state- and Federal-listed threatened and endangered species were compared to the habitats found in and around the proposed project site, and minimal risk of impacting any members of these species or their critical habitats was determined to exist. The U.S. Fish and Wildlife Service has confirmed this opinion for Federally listed or proposed species and their critical habitats.

Ephemeral ponds near the project site are covered by a tree canopy and contain silt, which provides a poor environment for the state-listed eastern tiger salamander (endangered). While field observations suggest that habitat for the pygmy shrew, a Federal-candidate species, does exist north of the project site, the habitat does not exist within the area to be developed. If the pygmy shrew is "listed" prior to completion of the project, an on-site survey may be necessary to confirm the lack of presence or suitable habitat.

*Water Resources:* Best Management Practices for erosion and sedimentation control and stormwater management would be employed during construction of the proposed plant. An Erosion and Sedimentation Control Plan would be developed and submitted to the King George County Conservation District for review and approval. The proposed project would not affect any wetlands. The nearest streams, which are tributaries of Birchwood Run, are protected by a riparian buffer and are approximately 1,000 feet from the project site. Hazardous chemicals and materials would not be used in significant quantities during either construction or operation of the proposed project, and the proposed project would not result in a significant consumption of water. Therefore, no impacts to water quality or quantity would be anticipated from the proposed project.

The proposed project site is not in a floodplain and therefore no impacts to flood flow or flood levels would occur.

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*Air Quality:* King George County, Virginia, is presently in attainment for all six criteria pollutants, as defined by the Clean Air Act (CAA) of 1977. The proposed lightweight aggregate manufacturing facility would emit only one of the criteria pollutants – particulate matter less than 10 microns (PM<sub>10</sub>) – and no hazardous air pollutants (as defined by the CAA Amendments of 1990). Because emissions of PM<sub>10</sub> would be less than 100 tons per year, the facility would not be considered a major source. However, the facility would be subject to Virginia Department of Environmental Quality construction and operating permit regulations for stationary emission sources. No significant impacts on air quality would be expected from the proposed project.

*Noise:* No noise-sensitive receptors are located in the vicinity of the proposed site. Because the project would create a negligible increase in noise levels over current conditions, noise impacts would be minimal.

*Hazardous Wastes:* Although hazardous wastes would not result from the proposed project, site preparation or construction work could uncover hazardous or residual wastes. If found, such wastes would be stockpiled, tested, and then transported for disposal in accordance with Federal, state, and local regulations. In addition, the lightweight aggregate produced from spray dryer ash has been tested using the U.S. Environmental Protection Agency's Toxicity Characteristic Leaching Procedure and found to be non-hazardous. No hazardous waste impacts would be expected.

*Land Use:* The proposed project site is zoned for industrial use, and the proposed project would not conflict with uses of the surrounding land.

*Socioeconomic Effects:* The proposed lightweight aggregate facility would create nine manufacturing jobs. In addition, because transport of aggregates and reagents would involve an increase in hauling, additional employment in the trucking industry may result.

Currently, the spray dryer ash from the Mirant-Birchwood Facility is used as a daily cover for the King George Landfill. A tipping fee of \$5/ton is paid to the landfill. Secondary economic impact would result from the loss of revenue currently realized by King George County for landfilling of the spray dryer ash. This revenue loss would be partially offset since the proposed facility would increase the tax base of the county.

Because the proposed project would not be expected to have significant adverse effects to human health or the environment and would not be located within low-income or minority neighborhoods, the proposed project would not result in any disproportionate adverse impact on minority or low-income populations.

*Transportation:* The proposed facility would be expected to generate a small increase in traffic over current levels. The plant would produce 167,000 tons of aggregate per year. At 18 tons per load, a total of 9,278 truckloads of processed aggregate would be exported from the site per year, or approximately 25 truck trips per day. The vast majority of truck trips would use Route 665 and Highway 3 to access I-95 near Fredericksburg. An estimated 75 percent of the trucks would travel north toward Washington and Baltimore, while the remaining 25 percent would travel south toward Richmond and Norfolk. Empty delivery trucks would return to the facility using the same route. Trips for hauling aggregate would replace a similar number of trips currently required for moving ash between the power plant and the King George Landfill, although traffic from the power plant to the landfill would use only about 1 mile of Route 665.

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The 9 additional workers employed at the plant would result in 18 additional automobile trips per day (9 in each direction). Approximately 360 loads of reagent would be delivered to the site per year. During the 8-month construction period, approximately 800 truck trips (3 to 4 per day) would be necessary to deliver construction material to the site. The majority of truck trips during construction as well as during normal operation would occur throughout the workday rather than during peak traffic periods.

The traffic impact study revealed that the project would have no impact on highway capacities.

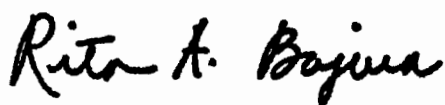
**ALTERNATIVE CONSIDERED:** In addition to the proposed action, DOE considered the No-Action Alternative, whereby DOE would not provide cost-shared funding to the project. Without DOE participation, Universal Aggregates would not proceed with construction and operation of the lightweight aggregate manufacturing facility at the Mirant-Birchwood Facility, and spray-dryer ash would continue to be used as daily cover at the King George County Landfill.

**PUBLIC AVAILABILITY:** A Draft EA was distributed to Federal and state agencies and to the public for review and comment. The Draft EA was also posted on the NETL website. Copies were made available for review at the L.E. Smoot Public Library in King George, Virginia. Public Notices announcing availability of the Draft EA were published in *The Journal Press* and *The Freelance Star*.

Two responses were received during the public participation process. King George County's Engineer provided a response that included (1) meeting minutes (July 9, 2002) from the Planning Commission recommending approval of Universal Aggregates' rezoning request and (2) meeting minutes (August 21, 2002) from the Board of Supervisors approving the recommendation. An additional response containing comments from various agencies of the Commonwealth of Virginia was also received. These comments, which pertained primarily to the need to adhere to Federal and state environmental regulations, were addressed in an Appendix to the EA. None of the received comments objected to the proposed action, specified significant environmental impacts from the proposed action, or identified any need to address the environmental analysis in greater detail.

**DETERMINATION:** Based on the information and analyses in the EA, DOE has determined that the proposed Federal action, to provide cost-shared financial support for the design, construction, and initial operation of a lightweight aggregate manufacturing plant at the Mirant-Birchwood Facility, does not constitute a major Federal action that would significantly affect the quality of the human environment, within the meaning of the National Environmental Policy Act. Therefore, an Environmental Impact Statement is not required, and the DOE is issuing this FONSI.

Issued in Pittsburgh, PA this 2<sup>nd</sup> day of October, 2002.



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