FINDING OF NO SIGNIFICANT IMPACT

FOR THE PROPOSED

COMMERCIAL DEMONSTRATION OF THE
NOXSO SO_2/NO_x REMOVAL FLUE GAS CLEANUP SYSTEM

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

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE has prepared an Environmental Assessment (EA) (DOE/EA-1080) for a project proposed by NOXSO Corporation for the cost-shared design, construction and operation of the NOXSO SO_2/NO_x Removal Flue Gas Cleanup System, hereafter referred to as the NOXSO Demonstration Project (NDP). The project would demonstrate this advanced flue gas treatment technology for reducing sulfur dioxide (SO_2) and nitrogen oxides (NO_X) emissions from coal-fired electric generating units. The NDP would be located at the Warrick Power Plant in Newburgh, Warrick County, Indiana. A second component of the NDP would be located at the Olin Charleston Plant in Charleston, Bradley County, Tennessee. The proposed Federal action is to provide cost-shared financial assistance for the project. Based on the analyses in the EA, DOE has determined that the proposed Federal 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. 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: In September 1988, Congress enacted Public Law No. 100-446 which provided funds for the third solicitation of the Clean Coal Technology (CCT) Program to DOE for cost-shared financial assistance to selected state and industrial participants. The objectives of the third solicitation are to demonstrate innovative, energy-efficient technologies that are ready to be commercialized in the 1990s and are capable of (1) achieving substantial reductions in the emissions of SO_2 and NO_X from existing facilities to minimize environmental impacts such as transboundary and interstate pollution, and (2) providing for future energy needs in an environmentally acceptable manner. On May 1, 1989, DOE issued a Program Opportunity Notice to solicit proposals for CCT demonstration projects. The proposed NDP was selected along with twelve other projects from among the 48 proposals received by DOE.

DESCRIPTION OF THE PROPOSED PROJECT: The objective of the NDP is to demonstrate the NOXSO flue gas treatment system in a fully integrated commercial-scale operation at an existing coal-fired electric generating unit. The proposed action would result in project activities at the two locations described below. Construction would begin in Summer 1995 with the two year demonstration project commencing in Fall 1996. Commercial operation of project components would continue indefinitely after the demonstration project.

NOXSO Demonstration Project at the Warrick Power Plant: The NOXSO system would be demonstrated at Alcoa Generating Company's Warrick Power Plant (WPP) in Newburgh, Indiana. The NOXSO system would be retrofitted to WPP's Unit 2, a 144 megawatt coal-fired electric generating unit. Reductions in SO_2 emissions from this project would generate emission allowances to Alcoa under the Clean Air Act's Opt-In Program.

The NOXSO process uses a dry regenerable sorbent (gamma-alumina bead) to remove SO_2 and NO_x from flue gas. At the WPP, flue gas from Unit 2's electrostatic precipitator would be routed to the NOXSO adsorber, where SO_2 and NO_x would be adsorbed onto the sorbent. The cleaned flue gas would exit the adsorber, pass through a baghouse to remove particulate matter, and finally exit through the stack. Sorbent from the adsorber would be regenerated in a series of process units resulting in off-gas generation. Off-gases containing NO_x would be recycled back to the Unit 2 boiler, and off-gases containing sulfur species would be processed in a sulfur recovery unit to produce an elemental sulfur by-product. The sulfur by-product would be shipped by rail to Tennessee for conversion into liquid SO_2 .

Resources required for operation of the NOXSO system would include make-up sorbent, steam, water, natural gas and electrical power. No additional coal would be required; however, during operation of the NDP, Alcoa would burn a high-sulfur coal in place of the current low- and high-sulfur coal blend.

The NOXSO system at WPP would be constructed in a previously disturbed area immediately south of Unit 2, and would occupy less than one acre of the 600 acre Alcoa property. Existing activities at the Alcoa site consist of the 732 megawatt WPP and an aluminum manufacturing

facility. New structures and equipment for the NDP would include the NOXSO process units as well as a sulfur recovery unit, baghouse, sorbent and sulfur storage tanks, rail spur, and relocated/extended utilities and ash pipelines.

NOXSO Demonstration Project at the Olin Charleston Plant: The second component of the NDP, the liquid SO_2 plant, would be located at Olin Corporation's Charleston Plant (OCP) in Charleston, Tennessee. The sulfur by-product from the NOXSO system would be converted into liquid SO_2 using the Calabrian Chemicals liquid SO_2 process, which oxidizes molten sulfur using pure oxygen. The oxygen would be supplied to the process from a conventional air separation unit.

Resources required for operation of the liquid SO_2 plant would include sulfur, water, caustic and electrical power. The plant would use all of the sulfur generated from the NOXSO system (16,000 tpy) and would produce 45,000 tpy of liquid SO_2. Olin Corporation would use the liquid SO_2 as feedstock for the manufacture of sodium hydrosulfite at OCP and Olin's Augusta, Georgia Plant. Surplus liquid SO_2 (13,000 tpy) would be sold on the open market.

The proposed liquid SO_2 plant would be constructed in a previously disturbed area and would occupy one acre of the 975 acre Olin property. The OCP is a large chemical facility, employing 625 personnel, that produces numerous chemicals including chlorine. New structures and equipment would include the liquid SO_2 plant, air separation unit, sulfur and liquid SO_2 storage tanks, and a caustic scrubber. Modifications to the existing rail yard would include construction of new liquid SO_2 and sulfur stations, a new hydrochloric acid siding and station, a new scale, and relocated chlorine stations.

ENVIRONMENTAL IMPACTS:

Environmental Impacts at the Warrick Power Plant Site: Construction impacts would be limited in duration and similar to other projects of this size. Standard construction practices would be used to minimize fugitive emissions, soil erosion and noise impacts. Construction would take place on a previously disturbed unvegetated area. Projects of similar size have been constructed at this site with only minimal impacts on environmental resources including the public roadway system.

NDP operation would reduce WPP Unit 2 SO_2 and NO_x emissions by 94% and 73% (25,000 tpy and 4,000 tpy), respectively. Emissions of particulate matter less than 10 microns in diameter would decrease by 83% (160 tpy) due to the new baghouse which would capture attrited sorbent particles resulting from sorbent breakdown in the NOXSO process. Although a small amount of attrited sorbent would be emitted through the stack, the chemical constituents found in sorbent are all present in existing fly ash emissions in similar amounts, thus minimal impacts are anticipated. Carbon dioxide emissions from Unit 2 would marginally increase by 4%.

Surface and groundwater resources would not be adversely affected by NDP operation. The existing groundwater supply system has ample capacity to meet the 4% increase over existing water use. Attrited sorbent waste would be combined with fly and bottom ash and managed in the existing ash pond system, resulting in a 0.4% increase over current ash generation. Due to very similar chemical compositions, the sorbent/ash mixture would be virtually indistinguishable from the existing ash. Wastewater discharge quality and quantity from the ash ponds to the Ohio River would remain the same. Other solid wastes generated would include spent catalysts and fouled heat transfer fluid. All non-ash wastes would be properly classified and disposed accordingly at permitted off-site facilities.

No adverse impacts on land use are anticipated. The NDP site is located outside the 100-year floodplain. Wetlands on the WPP facility would not be impacted based upon a 1980 Army Corps of Engineers assessment. Construction would occur within a previously disturbed unvegetated area of the WPP facility; therefore, no impacts on flora and fauna or biodiversity would be expected. Letters to DOE from the U.S. Fish and Wildlife Service and the State Historic Preservation Officer stated the project would have no impact on endangered species or archaeological/historic resources. Native American resources would not be affected by the project.

Transportation, noise, and health and safety impacts from NDP operation would be minimal. NDP operation would increase truck, passenger car and rail car traffic by no more than 5%. The slight increase in noise from the NDP would not be discernible to the community due to the location of the project within an operating power plant. Health and safety risks arising from the hydrogen sulfide intermediate produced by the NOXSO system would be minimized by use of a comprehensive health and safety program which would incorporate industry standard practices, as well as Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulations. The NDP process units are similar to others operated routinely nationwide. It is unlikely that a process or equipment failure would occur which would impact human health and safety.

Socioeconomic impacts would be slight. Construction would require 160 workers. Operation of the NDP would employ 12 personnel. As the project would take place at an existing large industrial facility, there would be no adverse impacts with regard to environmental justice concerns. Resource requirements for the project can be easily met by the existing Alcoa site infrastructure and purchases from vendors. Long-term environmental impacts from commercial operation would be similar to those experienced during the NDP. Adverse cumulative impacts due to other activities in the region are not anticipated.

Environmental Impacts at the Olin Charleston Plant Site: Construction impacts would be limited in duration and similar to other projects of this size. Standard construction practices would be used to minimize fugitive emissions, soil erosion and noise impacts. Construction activities would take place on previously disturbed unvegetated or grass-covered areas. Projects of similar size have been constructed at this site with only minimal impacts on environmental resources including the public roadway system.

Air quality in the region would not be adversely impacted by NDP operation. Installation of a caustic scrubber on the liquid SO_2 plant would result in negligible emissions from this unit. Existing SO_2 emissions at the site would decrease due to a reduced number of transfer line disconnections associated with SO_2 transfers to and from vehicles. Atmospheric fog conditions in the area would be unaffected by the project.

Impacts on surface and groundwater resources would be minimal. Operation of the liquid SO_2 plant would increase OCP's water withdrawals from the Hiwassee River by less than 1%. Discharge water quality and quantity would not be impacted. Wastes generated from liquid SO_2 plant operation would include sodium sulfite, ash, zeolite sieve material and silica gel. These wastes would be analyzed and disposed in accordance with applicable regulations. Pollution prevention and waste minimization measures inherent to the project would include beneficial reuse of the sulfur by-product produced at WPP, and the process design of the liquid SO_2 plant.

No adverse impacts on land use are anticipated. The proposed liquid SO_2 plant site and rail yard are located in an area of minimal flooding (outside the 100-year floodplain), based upon a certified topographic survey of the plant. The nearest wetland is located 150 feet east of the project site and would not be impacted. The liquid SO_2 plant would be constructed within a previously disturbed, grassed area of the Olin facility; therefore, no impacts on flora and fauna or biodiversity would be expected. Rail yard modifications would not impact flora or fauna. Letters to DOE from the U.S. Fish and Wildlife Service and the Tennessee Historical Commission stated the project would have no impact on endangered species or resources eligible for listing in the National Register of Historic Places. Native American resources would not be affected by the project.

Transportation and noise impacts from the NDP would be minimal. Operation of the liquid SO_2 plant would increase passenger car traffic by 1%, and truck traffic would decrease by 5% because liquid SO_2 would no longer be trucked to the site. Rail car traffic would increase by 7% as incoming sulfur and outgoing liquid SO_2 would be shipped by rail. Some liquid SO_2 could be shipped from the site by truck. Any slight increase in noise from the liquid SO_2 plant operations would not be noticeable to the community due to the project's location within an operating chemical plant.

The OCP currently uses 20,000 tpy of liquid SO_2 and stores approximately 190 tons on-site. The plant operates under detailed health and safety plans which include specific handling procedures for liquid SO_2 which incorporate OSHA and EPA regulations. Olin Corporation would revise existing health and safety plans to include the liquid SO_2 plant operation and rail car loading. It is unlikely that substantial quantities of hazardous substances would be released from the liquid SO_2 plant and storage tanks.

There would be minimal socioeconomic impacts from the project. Construction would require 20 workers, and four personnel would be required for NDP operation. As the project would take place at an existing large chemical manufacturing plant, there would be no adverse impacts with regard to environmental justice concerns. The plant would produce approximately 12% of the

U.S. demand for liquid SO_2. The merchant demand for liquid SO_2 is growing at a rate of about 3% per year; thus, the increased demand would potentially absorb the project's output by the year 2000.

Resource requirements for the project can be easily met by the existing site infrastructure and through purchases from vendors. Long-term environmental impacts from commercial operation would be similar to those experienced during the NDP. Adverse cumulative impacts due to other activities in the region are not anticipated.

ALTERNATIVES CONSIDERED: In addition to the proposed action, the no-action alternative was considered. Under the no-action alternative, DOE would not provide cost-shared funding for the NDP. The NOXSO system would probably not be installed at WPP and therefore would not be demonstrated for potential future commercialization. Construction of the liquid SO_2 plant at the OCP would also be unlikely. Alternative technologies and alternative sites are discussed in the EA and were eliminated from further consideration.

PUBLIC AVAILABILITY: This FONSI and the EA on which it is based, will be distributed to all persons and agencies known to be interested in or affected by the proposed action. Additional copies of the FONSI and EA may be obtained from the Pittsburgh Energy Technology Center.

DETERMINATION: The proposed Federal action, to provide cost-shared financial assistance for a demonstration project including the construction and operation of an advanced flue gas cleanup technology and associated liquid SO_2 plant, does not constitute a major Federal action that would significantly affect the quality of the human environment within the meaning of NEPA. This conclusion is based on the analyses contained in the EA. Therefore, an Environmental Impact Statement is not required and DOE is issuing this FONSI.

ISSUED IN PITTSBURGH, PA, this 26th day of June, 1995.

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