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FINDING OF NO SIGNIFICANT IMPACT
TENNESSEE VALLEY AUTHORITY

INSTALLATION OF FLUE GAS DESULFURIZATION SYSTEM ON PARADISE FOSSIL PLANT UNIT 3
Muhlenberg County, Kentucky

Proposed Action and Need

TVA needs to reduce sulfur dioxide (SO_2) emissions at PAF to meet requirements under the 1990 Clean Air Act (CAA) amendments. The purpose of the proposed project is to reduce SO_2 emissions from Unit 3 at Paradise Fossil Plant (PAF) by installing flue gas desulfurization (FGD) equipment that employs the wet limestone forced oxidation (LSFO) technology.

Alternatives

No Action

Under a No Action Alternative, no FGD or other system for SO_2 reduction from PAF Unit 3 would be installed. A No Action Alternative would not meet TVA's goal to reduce SO_2 emissions from PAF.

Action Alternative

Commercially available technologies were considered for application at PAF. Compatibility with existing operating and maintenance systems at the plant and the fact that no new types of byproducts or wastes would be introduced at the site were the major considerations resulting in selection of wet limestone scrubbing as the proposed application at PAF. No other FGD system was a viable candidate for the proposed SO_2 reduction project at PAF.

TVA's proposed and preferred action is the addition of an FGD (scrubber) system on Unit 3 at PAF. This action involves the construction of several subsystems and integration of these subsystems into plant operations and connection to various utilities that support their operation. Most of the plant and its operation would remain the same after the new scrubber is in place. Higher-sulfur coal would likely be burned in Unit 3, which could also mean changes in ash and heat content of the coal. The scrubber would be placed in service downstream of the current electrostatic precipitators (ESPs) and include a new stack.

The project is intended to reduce SO_2 emissions by at least 95 percent at full load conditions. Unit 3 at PAF consists of a single-furnace, once-through, balanced-draft, cyclone-fired boiler with a maximum capacity of 1,056 MW gross. The boiler was manufactured by Babcock and Wilcox. The unit has three forced draft fans feeding a two-gas pass/one-air pass tubular air heater manufactured by Babcock & Wilcox. The unit is a base load unit and is equipped with a selective catalytic reduction (SCR) system

and precipitator. The four existing induced draft fans and drives were upgraded when the SCR was added. The SCR operates in the "ozone season" which extends from May 1 through September 30.

The FGD system would be constructed in such a way that in the event of a scrubber malfunction necessitating its shutdown, the flue gases leaving the ESPs could bypass the scrubber. The bypass could be routed around the scrubber to the existing stack. As discussed in the EA (section 3.1.2), although operation in the bypass mode could result in a marginal increase in SO_2 impacts, these impacts would be well below the National Ambient Air Quality Standards (NAAQS). The bypass would be used very sparingly, and even then, in accordance with acid rain and other air quality regulations.

The proposed Unit 3 wet LSFO FGD system would consist of one or two absorbers, a system which receives bulk limestone and prepares a limestone slurry for use in the absorber, a gas handling system that would transport flue gas from the existing precipitators, a new stack, and a new gypsum handling system. These facilities are supported by a myriad of pumps, fans, utilities, ductwork, piping, and control systems.

Impacts Assessment

No Action

A decision not to build an FGD or other SO_2 reduction system at PAF would result in no new environmental impacts. The No Action Alternative for PAF would, however, likely result in the need to reduce SO_2 emissions from other TVA fossil plants or require purchase of additional pollution credit allowances.

Action Alternative

The FGD system for Unit 3 would be an addition to an expansive, heavy industrial facility having a significant property buffer, located in an area that has been heavily disturbed by prior surface mining and previous PAF plant development activities. The potential on-site construction impacts to terrestrial ecology, water quality, aquatic ecology, noise, land use, air quality, visual aesthetics, and archaeological and historic resources would not be significant. Operational impacts are primarily dependent upon the engineering features and safeguards included in the design of the FGD system and the environmental commitments. As described in the EA, the features, safeguards, and mitigation incorporated in the design of the proposed FGD system at PAF will ensure that impacts to the environment are insignificant.

Mitigation and Commitments

The following mitigation measures were identified as necessary to ensure that impacts to the environment are insignificant.

1. Unless or until TVA begins use of FGD slurry thickeners, as described in the subsection titled, *Use of Chemical Additives (DBA or AA) and/or Thickeners Under Normal, Expected Operating Flows and Low Flow Conditions* in Section 3.8.2 of this EA, TVA will meet limits of the PAF National Pollutant Discharge Elimination System (NPDES) permit and avoid aquatic toxicity by implementing **one** of the following conditions, as appropriate:

    - Operational controls for providing additional boiler slag (bottom ash) water to the main ash pond to reduce FGD effluent concentration at the

ash pond outfall to nontoxic levels (i.e., less than or equal to 20 percent FGD effluent), or

- Baffling of the ash pond to increase retention time adequately to assimilate FGD effluent concentration at the ash pond outfall to nontoxic levels, or

- Use of other appropriate, comparably effective, operational, or technological means that may be identified.

2. If the use of chemical additives (dibasic acid or adipic acid) to the scrubbers for Units 1 and 2 slurry is implemented, TVA will also incorporate the use of thickeners on these units to increase the efficiency of chemical additives and to reduce the volume of FGD effluent to a concentration that would not result in exceedances of the Whole Effluent Toxicity (WET) limits of the NPDES permit.

3. TVA will complete all appropriate coordination under section 106 of the National Historic Preservation Act (NHPA) at the time more specific information is available, and prior to making a decision on the purchase of limestone in 2005-2006.

4. TVA will obtain coverage under the construction storm water permit as needed and will implement best management practices (BMPs) during construction to minimize erosion and migration of sediment off-site.

5. Portable toilets will be provided for use by FGD project construction personnel.

6. If “in-stream” construction activity is needed to modify or place structures or to create room for new intake structures, Best Management and Best Engineering Practices would be used to limit sediment migration from the construction area.

7. If new pumps and/or electrical equipment are installed at the existing intake structure, they would be elevated above or flood proofed to the 500-year flood elevation 404.9.

8. If during construction, soil is removed that exhibits a noticeable diesel odor, then the soil will be tested for Total Petroleum Hydrocarbons (TPH) and Diesel Range Organics (DRO) and then disposed of, or managed on-site, in accordance with applicable Kentucky regulations.

9. Prior to any alternation of wetlands located within the area potentially affected by the limestone handling facility, TVA will coordinate with the U.S. Army Corps of Engineers (USACE) to obtain a jurisdictional determination. If USACE determines the wetlands to be jurisdictional, TVA will obtain the necessary USACE permit/state water quality certification and comply with the mitigation requirements in the permit or certification. TVA will site and design the limestone haul road such that the configuration minimizes

impacts to the small remaining (although already heavily disturbed) scrub-shrub headwater wetland area.

10. Hydrostatic test discharges would be handled in accordance with the Best Management Practice (BMP) developed in accordance with the KPDES permit.

11 The Kentucky Division of Water will be notified about the modification or expansion of the intake structure for a determination pertaining to Section 316(b) of the Clean Water Act.

Public and Intergovernmental Review

In December 2002, the Draft EA was placed on the TVA public Web site; Public Notice was published in the Bowling Green, Kentucky, newspaper; and a more widespread news release was made regarding availability of the EA. This release informed interested persons that copies of the EA were available by request from TVA staff in Environmental Policy and Planning, Knoxville, Tennessee. Copies of the EA were also made available in public libraries in Bowling Green, Drakesboro, and Louisville, Kentucky, Nashville, Tennessee, and the main TVA Corporate Library in downtown Knoxville, Tennessee.

In December 2002, copies of the draft EA were mailed to the Kentucky Department for Environmental Protection, the Kentucky Heritage Council, the National Park Service, the USACE, and the United States Fish and Wildlife Service. No comments or correspondence were received from agencies or the public during the 30-day comment period.

Conclusion and Findings

Environmental Policy and Planning's NEPA Administration staff has prepared the EA, titled "Installation of Flue Gas Desulfurization System on Paradise Fossil Plant Unit 3, Muhlenberg County, Kentucky," and determined that the potential environmental consequences of TVA's proposed action to construct and operate the flue gas desulfurization system has been adequately assessed and that the proposed action, is not a major federal action significantly affecting the quality of the environment. Accordingly, an environmental impact statement is not required.

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Date Signed