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Impact  
**Project Name:** NOxOUT Selective  
Noncatalytic Reduction  
Demonstration, Unit 1  
Shawnee Fossil Plant  
**Project Number:** 2005-44

**FINDING OF NO SIGNIFICANT IMPACT**  
**TENNESSEE VALLEY AUTHORITY**  
NOxOUT SELECTIVE NONCATALYTIC REDUCTION DEMONSTRATION  
SHAWNEE FOSSIL PLANT - UNIT 1

**Proposed Action and Need**

Tennessee Valley Authority (TVA) is proposing to install and evaluate equipment for removal of nitrogen oxides (NOx) from coal combustion flue gas, utilizing selective noncatalytic reduction on Unit 1 at Shawnee Fossil Plant (SHF). This action would help TVA meet its systemwide goal of reducing NOx emissions by over 78 percent. NOx emissions are a major factor in causing air pollution, including acid rain and high ground-level ozone concentrations. Reductions of NOx emissions are necessary to meet air regulatory requirements under Section 110 of the Clean Air Act.

**Alternatives**

This Environmental Assessment (EA) evaluated two alternatives: Alternative A, the No Action Alternative, and Alternative B (the Action Alternative), Demonstration of NOxOUT Selective Noncatalytic Reduction System (SNCR) on SHF Unit 1. Under Alternative A, the plant would not install and demonstrate the NOxOUT SNCR system on Unit 1 at SHF. Under Alternative A, there would be no physical or operational changes to SHF. Under Alternative B, the plant would install and demonstrate the NOxOUT SNCR system. There would also be minor physical additions outside and inside the powerhouse. This demonstration of the NOxOUT SNCR system would be conducted on SHF's Unit 1 during 2005 and 2006. If the demonstration proved successful, another environmental review would be conducted to determine if SNCR could be placed on additional units at SHF. Alternative B would add a temporary 21,000-gallon frac tank to store the 40 to 50 percent urea solution, a circulating module inside an enclosed modular building, and associated piping outside the powerhouse on the south side of the baghouse next to the Unit 1 stack at SHF. The metering module (elevation 374 between Units 1 and 2), the distribution modules (2 east of the boiler and 2 west of the boiler, elevation 374), and the 22 injectors (8 injectors [6 back and 1 on each side] on elevation 364.5, 6 injectors [front] on elevation 366.5, and 8 [6 in front and 1 on each side] on elevation 378) would be located inside the powerhouse.

TVA's preferred alternative is Alternative B, Installation and Demonstration of the NOxOUT SNCR System on SHF's Unit 1.

**Impacts Assessment**

SHF staff conducted a preliminary examination of the scope of this project and discussed issues of environmental concern. There were several media and resource areas that were determined to have no impacts, i.e., archeology, terrestrial ecology, visual, and noise impacts. However, there were a few media and resource areas that had uncertainties regarding the potential for impacts. The SHF staff determined that these areas needed a greater degree of evaluation. Subsequently, an EA was initiated. These media and resource areas were air, water (industrial wastewater, surface water, and groundwater),

solid waste, aquatic ecology, and protected aquatic species. A TVA interdisciplinary team reviewed the proposed project for potential direct, indirect, and cumulative effects of Alternative A, the No Action Alternative, and Alternative B, Demonstration of NOxOUT SNCR System on SHF Unit 1.

Under Alternative A, there would be no physical or operational changes to SHF. Therefore, there would be no additional impacts to SHF under this alternative. Under Alternative B, TVA would install the NOxOUT SNCR system in the Spring and Summer of 2005 on SHF's Unit 1 and demonstrate the NOxOUT SNCR system during 2005 and 2006. TVA evaluated these activities for potential environmental effects. For the media areas that had potential effects, mitigation commitments were put into place to ensure the environmental effects would be insignificant.

Under Alternative B, there would be the potential for impacts to surface water, groundwater, air quality, aquatic ecology, and solid waste from the installation and demonstration of the NOxOUT SNCR system on SHF's Unit 1.

With the commitments identified below (see Mitigation), impacts to industrial wastewater, surface water, groundwater, air quality, aquatic ecology, and solid waste would be insignificant. With mitigation safeguards to minimize the presence of ammonia in the discharge, there would be no impacts to listed species.

### **Mitigation**

The proposed action contains routine compliance measures including the use of Best Management Practices listed in the EA to minimize environmental impacts. In addition, to minimize and mitigate adverse effects, the following special mitigation measures will be followed:

- (1) To ensure that the ammonia concentration at the Outfall 001 discharge remained at or below the Criterion Maximum Concentration (Table 3-3 of EA) and Chronic Criterion Concentration (CCC) [Table 3-4 of EA] limitations that will safeguard water quality, protect aquatic life, and ensure there were no impacts to listed species, the Unit 1 air preheater (APH) cleaning waste will be retained in a pond (such as the chemical treatment pond), basin, frac tanks, or other containment, the ammonia concentration will be determined, and then the water will be slowly released to the ash pond to ensure adequate pond mixing. The number of days required for the staged release will depend on the ammonia concentration of the Unit 1 APH wash wastewater.
- (2) In order to obtain more precise information on SNCR impacts, during the demonstration of the technology on Unit 1, and to safeguard water quality, protect aquatic life, and ensure there were no impacts to listed species, TVA will monitor the ammonia concentration in:
  1. The ash pond inflow, midpoint, and discharge during the Unit 1 APH staged releases.
  2. The Unit 1 fly ash:
    - a. At the ash silo system to ensure the dry stack ash NH<sub>3</sub>-N content was not greater than 48 mg/kg (for Little Bayou Creek CCC limits).

- b. Discharged into the baghouse hoppers.
  - 3. Storm water runoff from the dry ash stacking area.
- (3) To ensure that the KPDES permit limits for both pH and acute toxicity are met, and to ensure that the effluent being discharged to the Ohio River will not exceed the CCC (Table 3-4 of EA) for ammonia, the existing carbon dioxide system will be utilized to control pH.

**Conclusion and Findings**

Environmental Policy and Planning’s National Environmental Policy Act (NEPA) Administration Staff reviewed NOxOUT SNCR Demonstration on SHF Unit 1 EA. The staff determined that the potential environmental consequences of Alternative B, installation and demonstration of NOxOUT SNCR System on SHF Unit 1 have been adequately addressed. This conclusion takes into account implementation of the environmental commitments and mitigation measures listed in Section 3.9 of the EA. Further, Alternative B, would have “no effect” on federally-listed threatened or endangered species. Therefore, Alternative B is not a major federal action significantly affecting the quality of the environment, and an environmental impact statement is not required.

*Original signed by*

*April 20, 2005*

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Date Signed