

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Kevin J. Moles  
Manager Regulatory Affairs

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U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

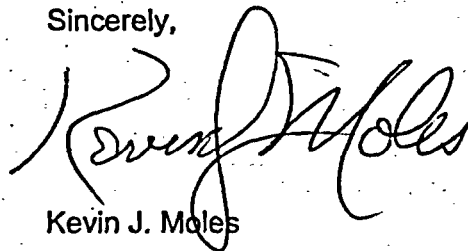
Subject: Docket No. 50-482: 2003 Annual Environmental Operating Report

Gentlemen:

Enclosed is the Annual Environmental Operating Report, which is being submitted pursuant to Wolf Creek Generating Station (WCGS) Facility Operating License NPF-42, Appendix B. This report covers the operation of WCGS for the period of January 1, 2003, through December 31, 2003.

No commitments are identified in this correspondence. If you have any questions concerning this matter, please contact me at (620) 364-4126, or Mr. William Muilenburg at (620) 364-8831, ext. 4511.

Sincerely,



Kevin J. Moles

KJM/rig

Enclosure

cc: J. N. Donohew (NRC), w/e  
D. N. Graves (NRC), w/e  
B. S. Mallett (NRC), w/e  
Senior Resident Inspector (NRC), w/e

IEAS

**WOLF CREEK GENERATING STATION  
ANNUAL ENVIRONMENTAL OPERATING REPORT 2003**

**ENVIRONMENTAL MANAGEMENT ORGANIZATION  
WOLF CREEK NUCLEAR OPERATING CORPORATION**

**P.O. BOX 411**

**BURLINGTON, KANSAS 66839**

**April 2004**

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## **1.0 INTRODUCTION**

The 2003 Annual Environmental Operating Report is being submitted in accordance with the objectives of the Environmental Protection Plan (EPP), Appendix B to the Facility Operating License NPF-42. The purpose of this report is to demonstrate that the Wolf Creek Generating Station (WCGS) was operated during 2003 in a manner protective of the environment.

## **2.0 ENVIRONMENTAL MONITORING**

### **2.1 AQUATIC [EPP Section 2.1]**

#### **2.1.1 Impacts of Water Withdrawal on the Neosho River**

The WCGS Final Environmental Statement/Operating License Stage (FES/OLS, Section 5.6), NUREG-0878, postulated that makeup water withdrawal of 41 cubic feet per second during drought conditions would extend the duration and severity of low-flow conditions below John Redmond Reservoir (JRR). This, in turn, was expected to reduce riffle habitat that would adversely affect the Neosho madtom, a federally listed threatened species.

Neosho River flows at Burlington were maintained during makeup withdrawal activities. Therefore, there were no adverse impacts to the Neosho River or Neosho madtom habitats attributable to WCGS water withdrawal during 2003. The owners of WCGS have contracted with the Kansas Water Resources Board to pump up to 9.672 billion gallons of water per calendar year to Wolf Creek Lake (WCL) from the tailwaters of the JRR. A total of 4.801 billion gallons, or 50 % of the contracted allotment, was used for WCGS purposes during 2003. The majority of the total, 4.707 billion gallons, was used for WCL makeup water, which was pumped from March 18 through May 8, May 10 through June 10, August 7, and December 15 through 21, 2003. The remainder, 0.094 billion gallons, was water pumped for use as auxiliary raw water for WCGS. Measurements at Burlington, Kansas, taken during 2003 by the United States Corp of Engineers, indicate that flows downstream of the WCGS withdrawal station in the Neosho River were not reduced by makeup pumping activities.

#### **2.1.2 Oxidizing Biocide Discharges to Wolf Creek Lake**

Circulating Water System (CWS) Discharge:

Biocide use at WCGS was predicted to cause periodic, appreciable mortality in a conservatively estimated 40 acres of the discharge area to WCL. However, these impacts were not expected to meaningfully affect the overall biological productivity of the lake (FES/OLS, Section 5.5.2.2). The postulated biocide levels expected to cause the impacts were from 0.68 to 1.08 mg/l of total residual chlorine at the CWS discharge (FES/OLS, Section 4.2.6.1). Three 30-minute doses per day of 411 pounds of chlorine per dose were projected to produce these concentrations.

Impacts from actual biocide use during 2003 were considered to be less than postulated in the FES/OLS. A sodium hypochlorite and sodium bromide formulation was used to control biological fouling in WCGS cooling water systems during 2003. Evaluations completed at WCGS demonstrated that the

sodium hypochlorite and sodium bromide formulation would not have greater impacts to the cooling lake environment than those expected from the level of chlorine use identified in the FES/OLS. All changes were reviewed and approved by the Kansas Department of Health and Environment (KDHE) prior to implementation.

The WCGS National Pollutant Discharge Elimination System (NPDES, Number I-NE07-PO02) permit limits biocide discharges to levels lower than postulated in the FES/OLS. This permit was administered by the KDHE. The biocide level for the CWS was limited to a maximum of 0.2 mg/l, total residual oxidant (TRO), for a maximum of two hours per day. Compliance during 2003 was 100 percent. Actual oxidizing biocide dosages averaged approximately 36.5 pounds per day and the daily average TRO was 0.08 mg/l.

#### Essential Service Water System (ESWS) Discharge:

During 2003 a continuous diversion of approximately 17,000 gallons per minute of WCGS Service Water System (SWS) flow to the ESWS was completed to provide microbiologically induced corrosion protection and sedimentation control. The SWS flows were diverted from SWS discharge with the CWS discharge. The KDHE established a 1.0 mg/l TRO limit for the SWS flow diversion through the ESWS. Actual measurements of TRO averaged <0.18 mg/l, and compliance with the NPDES limit in 2003 was 100 percent. No fish mortality or water quality changes attributable to ESWS biocide discharges were observed. Based on this information, permitted biocide discharge during 2003 did not have appreciable effects on the cooling lake environment.

#### 2.1.3 Cold Shock

In the event of a rapid decline in plant power level during winter, fishes attracted to the WCGS heated discharge could experience mortality due to a quick reduction in body temperature (cold shock). In reference to licensing document evaluations, the WCGS EPP Section 2.1 (c) states, "Cold shock effects on fish due to reactor shutdowns could cause significant mortality to aquatic species in the cooling lake."

No impacts due to cold shock mortality events occurred during 2003. There were three plant shutdowns during 2003. The first was on January 3, 2003, which was during a cold period when fish have generally been attracted to the warm water discharges, thus susceptible to cold shock events. This shutdown was of short duration, and no fish mortality was observed.

The remaining two shutdowns occurred on August 8 and September 29, 2003. These were during warm periods when fish tend to avoid the heated discharges. No fish mortality was observed after these plant shutdowns.

#### 2.1.4 Impingement and Entrainment

Impacts of entrainment and impingement of fish and aquatic organisms due to WCGS cooling water pumping were projected to be significant, as indicated in the WCGS EPP, Section 2.1 (d). EPP Section 2.1 states that the NRC relies on the State of Kansas for determination of the need for monitoring entrainment and impingement impacts. Although the State of Kansas has not required WCGS to

monitor entrainment and impingement impacts, periodic observations during 2003 indicated that fish impingement at the WCGS circulating water intake was negligible.

### **2.1.5 Impacts of Wolf Creek Lake Discharges to the Neosho River**

The WCGS NPDES permit requires that WCL discharges be sampled on the first day of each discharge and weekly thereafter until the end of each respective discharge. Discharge limits were set for chlorides and pH (NPDES Outfall 004). Lake discharges have typically occurred at the Blowdown Spillway and Service Spillway. During 2003, no discharges occurred at the Blowdown Spillway. In addition, lake levels remained low enough so that no discharges occurred from the Service Spillway during 2003. Consequently, no NPDES violations at the lake's discharge occurred, and no detrimental effects have been identified to the Neosho River water quality in 2003.

## **2.2 TERRESTRIAL [EPP Section 2.2]**

### **2.2.1 Control of Vegetation in the Exclusion Zone**

The composition and structure of vegetation in the 453 hectare (1120 acre) exclusion zone were selectively controlled to be compatible with the function and security of station facilities. Most areas in the immediate vicinity of the power block have been planted and maintained in a lawn-type condition. Other areas within the exclusion area have been mowed for security and aesthetic purposes. There were no changes in overall vegetation management of the exclusion zone during 2003.

### **2.2.2 Vegetation Buffer Zone Surrounding Wolf Creek Lake**

To create a buffer zone of least 500 acres around WCL, as specified in EPP, Section 2.2 (b), agricultural production activities were curtailed in 1980 within a border ranging from approximately 200-400 feet adjacent to the lake shoreline. This area is approximately 1440 acres. Previously grazed or hayed native grass areas were left undisturbed. Previously cultivated lands were allowed to advance through natural succession stages, or native grasses were reestablished in these areas. Land management activities included controlled burning to enhance and/or maintain the designated buffer zone with a naturally occurring biotic community.

### **2.2.3 Herbicide Use for Maintenance of WCGS Structures**

Herbicides were used on gravel areas, railroad easements, and various land areas associated with WCGS. Application rates followed label instructions. All herbicides used were registered by the Kansas Department of Agriculture when purchased. No environmental impacts from herbicide treatment of WCGS facilities were identified. A summary of herbicide application is provided below.

In areas where bare ground control was desired, a herbicide mix of Karmex DF (EPA Reg. No 352-508) and Oust (EPA Reg. No. 352-401) was used. Roundup Ultra (EPA Reg. No 524-475) was also used for problem weed areas. These herbicides were used on various gravel areas, including the switchyard,

protected area boundary, meteorological tower, storage tank berms, railroad beds, and storage yards.

Nuisance tree and brush growth was controlled with Tordon 22 K (EPA Reg. No. 62719-6), Tordon RTU (EPA Reg. No. 62719-31), Remedy, Farmland Weedone 2,4-D, Arsenal (EPA Reg. No. 241-346), or Escort (EPA Reg. No. 352-439). Areas treated included the dam, spillways, railroad easements, selected transmission line corridors, and selected grassland areas around the cooling lake.

Four plants listed as noxious weeds by the Kansas Department of Agriculture were controlled on WCGS lands. These were serecia lespedeza, musk thistle, Johnson grass, and field bindweed. Serecia lespedeza was treated with Remedy and Farmland Weedone 2,4-D. Musk thistle and Johnson grass were controlled by mechanical means, while the tenants of the agricultural leases controlled field bindweed through normal farming practices.

#### **2.2.4 Waterfowl Disease Contingency Plan and Monitoring**

A waterfowl disease contingency plan was maintained to provide guidance for station biologists in the event of suspected or actual disease outbreaks. The contingency plan lists appropriate federal and state wildlife agency contacts to be made by WCNOG in the event of such problems. During routine environmental monitoring and surveillance activities taking place over this reporting period, no waterfowl mortality attributable to disease pathogens was identified.

#### **2.2.5 Fog Monitoring Program [EPP Subsection 4.2.1]**

Visibility monitoring was initiated in December, 1983, and continued through 1987. The purpose of this study was to evaluate the impact of waste heat dissipation from WCL on fog occurrence along U. S. 75 near New Strawn, Kansas. The program was required through one year of commercial operation that started in September, 1985. Upon conclusion of 1987 data collection, sufficient information was available to evaluate cooling lake fogging, and all commitments relevant to fog monitoring had been satisfied. The fog monitoring study concluded that operation of WCGS did not appreciably increase fogging incidents from that measured before operation.

During 2003, there were no reports of fogging incidents in the vicinity of nearby U. S. 75 from individuals or local agencies responsible for traffic safety. Periodic fogging caused by the cooling lake did occur during the winter months of 2003, but was restricted to the plant site. No mitigation actions or further monitoring were warranted.

#### **2.2.6 Wildlife Monitoring Program [EPP Subsection 4.2.2]**

A wildlife monitoring program was initiated in 1982 to monitor and assess waterfowl, waterbird, and bald eagle usage of WCL. This program included transmission-line collision surveys to assess collision mortality and determine potential mitigation needs. This wildlife monitoring program was to continue for at least two years following WCGS start-up (FES/OLS Section 5.5.1.2), which occurred during September, 1985. Upon completion of 1996 monitoring, sufficient data had been collected to determine waterfowl, waterbird, and bald

eagle usage of WCL. Consequently, the scope of the wildlife monitoring program was reduced. The current program consists of reviewing WCL waterfowl and bald eagle survey data collected by the Kansas Department of Wildlife and Parks (KDWP). If review of the KDWP's data indicates usage has changed from that previously documented, then additional monitoring may be initiated. This additional monitoring may include collision mortality surveys.

Review of waterfowl and bald eagle monitoring data from the KDWP indicate that no significant usage changes occurred during 2003. No disease outbreaks or widespread crop depredation attributable to waterfowl use of WCL was observed in 2003. No changes to the wildlife monitoring program were warranted.

#### **2.2.7 Land Management Program [EPP Subsection 4.2.3]**

Land management activities on all company-owned lands except within the 453 hectare (1120 acre) WCGS exclusion area were designed to achieve balances between agricultural production and conservation values. An annual management plan addressed needs and accepted techniques for land maintenance, soil conservation, and wildlife management. These included the repair or construction of soil conservation structures, wetland areas, and permanent vegetative covers. An environmental education area was improved and maintained as part of the land management program. A summary of the land management activities appears in Section 4.1 of this report. The land management program continued in 2003 to balance agriculture production and conservation values.

### **3.0 ENVIRONMENTAL PROTECTION PLAN REPORTING REQUIREMENTS**

#### **3.1 PLANT DESIGN OR OPERATION CHANGES [EPP Section 3.1]**

Proposed plant design and operational changes which have the potential to affect the environment must receive an environmental evaluation prior to implementation. One change that required an environmental evaluation in 2003 is presented below. Conclusions were that this station design and operational change did not involve an unreviewed environmental question per the EPP. There were no events identified in 2003 that required changes to the EPP.

The environmental evaluation completed was for the construction and operation of a new water treatment building and equipment. The purpose of the new facility will be to support the water quality and continuous flow demands of the High pH Secondary Water Chemistry Program being implemented to reduce corrosion product transport to the steam generators. Water will be supplied to the new facility from Service Water and Raw Water Systems. Wastewater from the facility will be routed to the existing Circulating Water System discharge (NPDES Outfall 003b), and as an alternate discharge path, through the Waste Water Treatment Plant. The KDHE has approved the waste discharges. All construction activities were to be confined to areas previously disturbed during WCGS construction.



## **3.2 NON-ROUTINE ENVIRONMENTAL REPORTS**

### **3.2.1 Submitted Non-routine Reports**

There were no environmental reports involving significant non-routine impacts submitted to the NRC during 2003.

### **3.2.2 Unusual or Important Environmental Event Evaluations**

No unusual or important environmental events reportable according to specifications in the EPP were identified during 2003.

## **3.3 ENVIRONMENTAL NONCOMPLIANCES [EPP Subsection 5.4.1]**

Potential non-radiological environmental noncompliances and noteworthy events were documented and evaluated in accordance with WCNOC's Corrective Action Program, using Performance Improvement Requests (PIRs). A PIR is WCNOC's administrative vehicle for corrective action. Improvement items evaluated included hazardous waste management and minimization efforts, hazardous waste stream analyses, lead management at the weapons range, clean air permit administration, and nuisance bird management in security areas. Discrepancies were identified and addressed for hazardous waste documentation, minor drum spillage, and procedural reportability evaluations. All the documented events were determined not to be reportable pursuant to EPP criteria.

## **4.0 SUMMARY OF ENVIRONMENTAL INVESTIGATIONS AT WOLF CREEK GENERATING STATION**

### **4.1 2003 LAND MANAGEMENT ACTIVITIES**

The EPP requires a land management program that will implement conservation and wildlife management techniques to attempt to balance production and conservation values (EPP Section 4.2.3). The land management program at WCGS satisfied this requirement. Specific program objectives were to:

- a. conserve or improve both agricultural and natural resources,
- b. foster good relations with local agricultural and natural resource communities,
- c. satisfy licensing requirements,
- d. improve the appearance of the company's lands, and
- e. enhance, for educational purposes, the natural resources of the Environmental Education Area (EEA).

These objectives were attained as explained below.

Grasslands at WCGS consisted of areas leased for grazing and hay production and other areas maintained for regulatory compliance, soil conservation, and wildlife. Areas adjacent to WCL, approximately 1440 acres, exceeded the 500 acre buffer zone of "naturally occurring biotic communities" referenced in the EPP. Approximately 1,422 acres of native rangeland were leased for grazing in 2003 with 8 local tenants. Leases specified rotation programs, season lengths, and maximum grazing rates. By controlling these variables, range quality was maintained at levels, which provided optimum wildlife value and long term rent generation.

Approximately 542 acres were leased to 13 local farmers for hay production in 2003. Hay meadows were managed for high quality production by requiring hay to be cut by July 31 and bales removed by August 31. No late cutting was allowed.

Fire has always been an integral part of the prairie and was used to control woody brush invasion, control less desirable cool-season grasses or weeds, increase wildlife value, and to increase prairie vigor and production. Prescribed burning was completed on approximately 779 acres during 2003.

Management of cropland reduced soil erosion, maintained rent income, and increased wildlife benefits. Conservation farming, terracing, and wildlife strip management continued to help achieve the objectives. A total of 1272 acres of cropland was leased to 12 local farmers in 2003. Consistent with past years, the cropland lease requirements specified that common conservation practices be followed. On fields with appropriate terraces to follow, contour farming was required. Fall tillage of crop residues was generally prohibited to reduce soil erosion.

Activities at the EEA were designed to improve wildlife habitat and increase the public's chances to view a greater variety of wildlife. Wildlife food plots, controlled burning, and trail improvements were a few of the techniques employed. The EEA has drawn a large amount of attention and continues to be well suited for educational purposes.

#### **4.2. 2003 ZEBRA MUSSEL MONITORING ACTIVITIES**

Zebra mussels were not observed during 2003 monitoring of the Neosho River and WCL. Monitoring was completed to provide early detection so that zebra mussel prevention plans could be initiated at WCGS. Monitoring included substrate and shoreline searches of the Neosho River upstream of JRR and immediately downstream of JRR in the vicinity of the Makeup-water Screen House (MUSH), where water is pumped from the Neosho River to WCL. Settlement monitors were placed and substrate scrapes were conducted at plant structures on the Neosho River and WCL. Inspections of fishing boats were also continued through 2003.

As a result of zebra mussels being discovered at El Dorado Lake, Kansas, on August 25, 2003, boat inspection forms were updated and lake attendant training was completed to ensure awareness of the increased potential for zebra mussels. El Dorado Lake, approximately 80 miles southwest of WCGS, is in the Walnut River drainage, which is immediately west of the Cottonwood/Neosho drainage. This places potential sources of zebra mussels for transport to the Neosho River and WCL much closer than previously, which was north central Oklahoma. Zebra mussels were also found in 2003 at two new inland lakes by Tulsa, Oklahoma.

The Neosho River and WCL would be conducive for zebra mussel survival and growth based on water quality conditions present. Introduction to WCL will most likely be caused by WCGS pumping activities from the Neosho River. Boat inspections will likely prevent mussel introduction via recreational boats. Contact with the Kansas Department of Wildlife and Parks and the Kansas Department of Health and Environment will continue to enhance monitoring and maintain awareness of mussel range extension in the area. These efforts will help ensure that zebra mussels are detected as early as practical in the WCGS area.

### 4.3 2003 FISHERY MONITORING ACTIVITIES

The results obtained from fishery monitoring of WCL during 2003 indicate that the potential for gizzard shad impingement at the cooling water intake screens has remained low. The primary objective of the monitoring was to measure fish population dynamics to determine shad impingement potential. The fishery assessments targeted gizzard shad, the predator species that feed on them, and the predator-prey interactions.

Catch frequencies of young gizzard shad remained low during 2003. Consequently, no impingement problems developed. No signs of increasing densities of shad were observed.

The 2003 monitoring revealed that the predator populations showed favorable signs for continued shad control. Predator populations, as a whole, showed signs of being prey limited. Growth rates and body conditions improved for most species. Continuous declines in these areas would raise concerns, because it is important that the predator populations remain viable so that shad control continues. Catch rates were similar to past years', and recruitment was evident for many predator species. Predator populations assessed were white bass, wiper hybrids, largemouth bass, smallmouth bass, white crappie, and walleye.

Angling impacts to the predators' shad control benefits were also assessed. The catch-and-release philosophy being stressed at WCL has made the limited harvest compatible with continued shad control. Innovative length limits were put in place for smallmouth bass and walleye in an attempt to promote larger individuals. Significant improvements that could be tied to the changes were not present, except possibly increases in body conditions. The potential for supporting larger individuals with the length limits used is encouraging. Monitoring data will be important to ensure no adverse impacts to the fishery results from angler harvest.