

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Britt T. McKinney
Vice President Operations

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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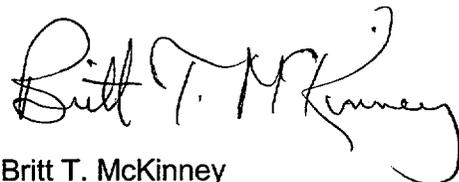
Subject: Docket No. 50-482: 2001 Annual Environmental Operating Report

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, 2001, through December 31, 2001.

No commitments are identified in this correspondence. If you have any questions concerning this matter, please contact me at (620) 364-4112, or Mr. Tony Harris at (620) 364-4038.

Very truly yours,



Britt T. McKinney

BTM/krp

Enclosure

cc: J. N. Donohew (NRC), w/e
D. N. Graves (NRC), w/e
E. W. Merschoff (NRC), w/e
Senior Resident Inspector (NRC), w/e

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**WOLF CREEK GENERATING STATION
ANNUAL ENVIRONMENTAL OPERATING REPORT 2001**

**ENVIRONMENTAL MANAGEMENT ORGANIZATION
WOLF CREEK NUCLEAR OPERATING CORPORATION
P.O. BOX 411
BURLINGTON, KANSAS 66839**

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1.0 INTRODUCTION

Wolf Creek Nuclear Operating Corporation (WCNOC) has committed to minimizing the impact on the environment from operating Wolf Creek Generating Station (WCGS). The 2001 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 plant operated during 2001 in an environmentally acceptable manner.

2.0 ENVIRONMENTAL MONITORING

2.1 AQUATIC [EPP Section 2.1]

2.1.1 Impacts of Water Withdrawal on the Neosho River

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 John Redmond Reservoir (JRR). A total of 4.807 billion gallons, or 50% of the contracted allotment, was used for WCGS purposes during 2001. The majority of the total, 4.596 billion gallons, was used for WCL makeup water, which was pumped from March 6 through March 26, April 1 through April 29, May 17 through May 25, June 4 through June 7, and September 28 through October 19, 2001. The remainder, 0.211 billion gallons, was water pumped for use as auxiliary raw water for WCGS. Measurements at Burlington, Kansas, taken during 2001 by the United States Geological Survey, indicate that flows downstream of the WCGS withdrawal station in the Neosho River were not affected by makeup pumping activities. Consequently, there were no adverse impacts to the Neosho River attributable to WCGS pumping activities during 2001.

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 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 was no impact to Neosho madtom habitats from WCGS water withdrawal during 2001.

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 2001 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 2001. Evaluations completed by WCNOG 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 2001 was 100 percent. Actual oxidizing biocide dosages averaged approximately 41.5 pounds per day and the daily average TRO was 0.08 mg/l.

As a NPDES permit requirement, whole effluent toxicity testing was completed at the CWS discharge during a biocide treatment. Acute toxicity was not detected for the water flea (*Ceriodaphnia dubia*) and fathead minnow (*Pimephales promelas*) exposed to the CWS effluent. No mortality to the test organisms occurred. Results from the whole effluent testing indicated that permitted biocide discharges during 2001 did not have adverse impacts on the cooling lake environment, and that actual biocide use has been less than the potential impacts evaluated in the FES/OLS.

Essential Service Water System (ESWS) Discharge:

During 2001, 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 <0.16 mg/l, and compliance with the NPDES limit in 2001 was 100%. No fish mortality or water quality changes attributable to ESWS biocide discharges were observed. Based on this information, permitted biocide discharge during 2001 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."

Four power level reductions occurred during 2001. These reductions occurred to support plant maintenance on March 16, March 22, May 11, and May 29, 2001 and ranged from 4.5 to 28.3 hours in duration. Water temperatures in the heated discharge area of WCL were within the range that would attract some

fish during the March, 2001 power reductions, but high enough to cause fish to avoid the area during the May, 2001 reductions. All the power reductions were gradual and of short duration, and no cold shock effects were identified after the changes. Therefore, there were no impacts to fish from cold shock effects during 2001.

2.1.4 Impingement and Entrainment

Impacts of entrainment and impingement due to the operation of WCGS 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 2001 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). One short-term lake discharge occurred resulting from testing of the Blowdown Spillway. In the past, lake discharges have typically occurred at the Service Spillway, but lake levels remained low enough so that no discharges occurred from that spillway in 2001. No NPDES violations at the lake's discharge occurred, and no detrimental effects have been identified to the Neosho River water quality in 2001. Therefore, there were no adverse impacts to the Neosho River from the WCL discharge identified during 2001.

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 vegetation management of the exclusion zone during 2001.

2.2.2 Vegetation Buffer Zone Surrounding Wolf Creek Lake

To create buffer zone of least 500 acres around WCL, agricultural production activities were curtailed in 1980 within a border ranging from approximately 200-400 feet adjacent to the lake shoreline. This border ranges from approximately 200 to 400 feet adjacent to the lake shoreline. 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. Actual area of this buffer was approximately 1440

acres, which exceeded the minimum of 500 acres referenced in the EPP, Section 2.2 (b).

2.2.3 Herbicide Use for Maintenance of WCGS Structures

Herbicides were used on transmission line corridors, 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.

The LaCygne to Benton 345 kilovolt (KV) transmission line corridor on property associated with WCGS was treated to control undesirable tree growth. Treatment included mechanical removal and herbicide spraying. Herbicides used were Tordon RTU (EPA Reg. No. 62719-31), Remedy (EPA Reg. No. 62719-70), and Farmland Weedone 2,4-D (EPA Reg. No. 264-518).

In areas where bare ground control was desired, an 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, Remedy, Farmland Weedone 2,4-D, and Roundup Ultra. Areas treated included the dam, spillways, railroad easements, 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 seresia lespedeza, musk thistle, Johnson grass, and field bindweed. Serecia lespedeza was treated with Remedy and Farmland Weedone 2,4-D. Musk thistle was controlled by mechanical means. Johnson grass was controlled with Roundup Ultra 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 2001, 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 2001, 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 to 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 indicates that no significant usage changes occurred during 2001. No disease outbreaks or substantial crop depredation attributable to waterfowl use of WCL was observed in 2001. 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 year 2001 land management activities appears in Section 4.1 of this report. The land management program continued in 2001 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. A summary of each modification or operating change that required an environmental evaluation in 2001 is presented below. There were no changes in station design or operation nor were there tests or experiments that involved an un-reviewed environmental question during 2001. There were no events identified that required changes to the EPP.

Evaluation: Dredging of Ultimate Heat Sink Channel

This evaluation demonstrated that no adverse impacts to the environment would result from removing sediment from the Ultimate Heat Sink channel and placing it in another area of WCL. This conclusion was based on the activities being confined to areas previously disturbed during plant construction and compliance with requirements of the U. S. Corp of Engineers dredge permit issued for the project. A water quality protection plan was also put into place in accordance with KDHE requirements. In addition, no adverse impacts were observed during similar dredging activities during 1991 and 1997. Consequently, no adverse environmental impacts were expected or observed.

Evaluation: Biocide Use in Closed Cooling Water Systems

This evaluation documented that no adverse environmental impacts would result from procedure changes to provide guidance for the use of glutaraldehyde and isothiazolone as biocides in WCGS closed cooling water systems. After the biocides would be added to a system, they would degrade and rapidly decompose under normal conditions present in WCGS closed cooling water systems. They would be broken down by various mechanisms to carbon dioxide, water, and hydrogen. Any residual biocide would be deactivated and diluted to below detectable concentrations in the Waste Water Treatment Facility. No adverse impacts were expected or observed from biocide addition to closed cooling water systems.

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 2001.

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 2001.

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. Events evaluated included refrigerant management improvements, solid waste management improvements, nuisance bird control resolution, minor chemical spill investigation, hazardous material transporting improvement, contract laboratory accuracy issues, waste stabilization pond sample discrepancies, and chemical release reporting review. 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 2001 LAND MANAGEMENT ACTIVITIES

This document presents the 2001 activities for the WCGS land management program. 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). Values beyond meeting EPP requirements were also realized. The 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 range-land were leased for grazing in 2001 with 11 separate lease agreements. 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 517 acres were leased to 13 local farmers for hay production in 2001. 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 619 acres during 2001. It was a relatively inexpensive and environmentally compatible method of meeting these objectives.

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 1256 acres of cropland was leased to 11 local farmers in 2001. Consistent with past years, the cropland lease contracts specified that common conservation practices be followed. On fields with appropriate terraces to follow, contour farming was required. Fall tillage of crop residues was prohibited except for certain instances, such as tillage necessary for fall planting of wheat, plowing of terraces and deep tillage practices to improve productivity.

Activities at the EEA were designed to improve wildlife habitat and increase the public's chances to view a greater variety of wildlife. Tree and shrub planting, 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. 2001 ZEBRA MUSSEL MONITORING ACTIVITIES

Zebra mussels were not found to occupy habitats in the Neosho River or WCL during 2001. Monitoring was completed to provide early detection so that zebra mussel prevention plans can 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 WCGS Makeup Water Pump House, where water is pumped from the Neosho River to WCL.

Zebra mussels were also not reported to inhabit most Kansas waters during 2001. Zebra mussel shells were removed from strainers at a power plant in Kansas City, Kansas, but no live specimens were found. One adult zebra mussel was found at a Mid-America Energy Company power plant on the Missouri River near Sioux City, Iowa in April, 1999. A marina employee also found them on a recreational boat in February, 2000, before the boat was launched at Lake of the Ozarks in Missouri.

The water quality conditions in the Neosho River and WCL would be conducive for zebra mussel survival and growth. Introduction to WCL will most likely be caused by WCGS pumping activities from the Neosho River, from being transported on recreational boats, or from fish stocking activities. Because of the ability of this mussel to quickly inhabit and foul plant water systems after infesting WCL, monitoring for the initial presence of zebra mussels in the vicinity of WCGS was recommended to continue.

4.3 2001 FISHERY MONITORING ACTIVITIES

Fishery monitoring activities during 2001 were limited due to the cancellation of the fall sampling efforts because of heightened security necessary after the September 11, 2001 events. Fall electro-shocking, trap netting, and gill netting were not completed in 2001. The spring electro-shocking samples were collected which provides some insights into the fishery. The primary objectives of the monitoring were to measure fish population dynamics to determine shad impingement potential and to detect impacts due to angling.

The spring electro-shocking data indicate that few shad that were spawned during the summer of 2000 were present in 2001. This implies that predation by game fish was sufficient to keep the densities of small shad low and that few of the young shad survived through the winter of 2000-2001. Because fall sampling did not occur, shad production during the summer of 2001 could not be assessed. Periodic observations of the WCGS circulating water intake revealed that nearly no young shad were being impinged during late 2001. This indicates that the fishery continued to function as intended.

Angling impacts to the predators' shad control benefits was a goal of the fishery monitoring program. The catch-and-release philosophy being stressed in the past at WCL has made the limited harvest compatible with continued shad control. Angler access was prevented in response to heightened security needs after the September 11, 2001 events and this would tend to reduce any potential impacts to the fishery due to angling. No adverse impacts to the fishery resulting from angler harvest were observed during past years.