WOLF CREEK
NUCLEAR OPERATING CORPORATION

Ron Benham
Manager Nuclear and Regulatory Affairs

April 29, 2019

RA 19-0049

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

Subject: Docket No. 50-482: Annual Environmental Operating Report 2018

To Whom It May Concern:

The purpose of this letter is to submit the enclosed Annual Environmental Operating Report. The Annual Environmental Operating Report is being submitted pursuant to Wolf Creek Generating Station (WCGS) Renewed Facility Operating License NPF-42, Appendix B, "Environmental Protection Plan." This report covers the operation of WCGS for the period of January 1, 2018, through December 31, 2018.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4204.

Sincerely,

Ron Benham

RDB/rlt

Enclosure: Wolf Creek Generating Station Annual Environmental Operating Report 2018

cc: S. A. Morris (NRC), w/e
B. K. Singal (NRC), w/e
N. H. Taylor (NRC), w/e
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IE25
NRR

WOLF CREEK GENERATING STATION

ANNUAL ENVIRONMENTAL OPERATING REPORT

2018

ENVIRONMENTAL MANAGEMENT ORGANIZATION

WOLF CREEK NUCLEAR OPERATING CORPORATION

P.O. BOX 411

BURLINGTON, KANSAS 66839

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1.0 INTRODUCTION

The 2018 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) operated during 2018 in a manner protective of the environment.

2.0 ENVIRONMENTAL MONITORING

2.1 AQUATIC [ENVIRONMENTAL PROTECTION PLAN (EPP) Section 2.1]

2.1.1 Impacts of Water Withdrawal on the Neosho River

There were no adverse impacts to the Neosho River due to water-use conflicts because river flows downstream of the makeup pumps were maintained during 2018. Additionally, minimum streamflow at Parsons, Kansas, set by the operations agreement for the Cottonwood Neosho Water Assurance District number three, was exceeded throughout 2018.

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 (cfs) 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.

Actual makeup water withdrawals during 2018 are summarized as follows:

Source	2018 Period	Duration (days)	Average Pump Rate (cfs)	[1]River Flow (cfs)		
				Avg	Min	Max
John Redmond Storage	2/26-5/5, 6/30-8/27, 9/6-9/10, 10/6-10/11	135	96	74	36	228
[2]Neosho River	8/28-9/5, 9/7, 9/11-10/9, 10/12-10/21	48	1	2686	253	8220

(1) Flow measured at United States Geological Survey Gauging Station in Burlington, Kansas.
(2) Before natural flows from the Neosho River are permitted by the Kansas Department of Agriculture, Division of Water Resources to be pumped, a 250 cfs minimum must be maintained downstream of the pumps. Otherwise makeup water is considered to be from JRR storage.

As shown above, average pump rates were slightly more than average river flows, when using John Redmond Storage, as measured at the United States Geological Survey Gauging Station in Burlington, Kansas, downstream of the pumps at the Makeup Water Screenhouse (MUSH). The minimum river flow was

36 cfs below the pumps while pumping. This demonstrates that downstream flows were maintained. In addition, makeup pumps were operated under permitted water 48 of the 183 pumping days.

For comparison purposes, the 41 cfs assessed in the FES/OLS refers to a continuous annual average from JRR storage. The actual 2018 pumping from JRR storage averaged 96 cfs for 135 days, which was equivalent to 34 cfs, when calculated on a similar, annual basis. This flow rate was lower than the 41 cfs evaluated as impacting the Neosho River during drought conditions.

Auxiliary makeup pumps were operated at flows ranging from 1-2 cfs for 71 of the 183 pumping days in 2018. This was during a time when the Neosho River system was experiencing below-normal hydrologic conditions.

Consequently, makeup pumping activities did not impact flows intended to maintain minimum stream flows in the Neosho River, and no adverse impacts due to water-use conflicts occurred during 2018.

2.1.2 Oxidizing Biocide Discharges to Coffey County Lake (CCL)

Circulating Water System (CWS) Discharge:

There were no adverse impacts observed due to biocides during 2018. Biocide use at WCGS was predicted to cause periodic, appreciable mortality in a conservatively estimated 40 acres of the discharge area to CCL. 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).

Actual maximum biocide concentration measured was 0.16 mg/l, and averaged 0.10 mg/l total residual oxidant (TRO) during 2018. This level was much lower than those evaluated in the FES/OLS, thus impacts were considered to be correspondingly less. The Kansas Department of Health and Environment (KDHE) also requires, through the WCGS National Pollutant Discharge Elimination System (NPDES) permit, that biocide discharges for the CWS be less than 0.2 mg/l TRO, for a maximum of two hours per day. Consequently, biocide impacts to CCL have been less than initially evaluated in the FES/OLS, and NPDES compliance assures that this will continue.

Essential Service Water System (ESWS) Discharge:

Flow from the WCGS Service Water System (SWS) diverted through the Essential Service Water System (ESWS) was completed to provide microbiologically induced corrosion protection and sedimentation control. The KDHE established a 1.0 mg/l TRO limit for the SWS diversion through the ESWS. Actual maximum TRO was 0.70 mg/l, and averaged 0.35 mg/l during 2018. Based on this information, permitted biocide discharges 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, fish 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."

Fish mortality due to cold shock was not observed in CCL following declines in plant power level. Unplanned plant shutdown or considerable power level decrease did not occur in 2018.

Fish mortality was not observed following the plant power changes. Consequently, significant impact to the fishery in CCL due to cold shock events did not occur during 2018.

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. The KDHE requested WCGS to monitor impingement impacts for the Clean Water Act (CWA) 316 (b), Phase II regulations. This monitoring has been completed, and results were submitted to the KDHE in 2008. Entrainment monitoring has not been required. No significant adverse impacts to the CCL fishery were identified because of impingement. Fishery management at WCGS has succeeded in controlling impingement, and minimized potential impacts of impingement to the fishery.

2.1.5 Impacts of Coffey County Lake Discharges to the Neosho River

The WCGS NPDES permit requires that CCL discharges be sampled on the first day of each discharge and weekly thereafter until the end of each respective discharge. A discharge limit was set for pH (NPDES Outfall 004). Lake discharges can occur at the Blowdown Spillway and Service Spillway. During 2018, no discharges occurred at the Blowdown Spillway. There were no NPDES violations from discharges from the Service Spillway, and no detrimental effects were expected to the Neosho River water quality.

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 typically have been planted and maintained in a lawn-type condition. Other areas within the exclusion area have been mowed for security and aesthetic purposes. Tree and brush control occurred in some areas.

Various maintenance and construction activities during 2018 have caused temporary impacts to the vegetation in many areas surrounding WCGS. As projects are completed, restoration of the areas involved is expected to return the vegetation in the exclusion zone similar to previous conditions.

2.2.2 Vegetation Buffer Zone Surrounding Coffey County Lake

To create a buffer zone of at least 500 acres around CCL, 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 established 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 transmission corridors, gravel areas, railroad easements, and various land areas associated with WCGS. Only herbicides approved by Environmental Protection Agency and the state of Kansas were used. Application rates followed label instructions. No adverse environmental impacts from herbicide treatment of WCGS facilities were identified.

The transmission lines associated with WCGS include the Wolf Creek-Rose Hill and a small portion of the Wolf Creek-Benton and Wolf Creek/Waverly/La Cygne lines. Herbicides for bare ground control were used on various gravel areas, including the switchyard, protected area boundary, meteorological tower, storage tank berms, railroad beds, and storage yards. Noxious weed and nuisance tree/brush growth were controlled on the dam, and selected grassland areas around the cooling lake.

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 Wolf Creek Nuclear Operating Corporation (WCNOC) in the event of such problems. The waterfowl disease contingency plan is located in section 5.3.2 of the Avian Protection Plan. 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]

Fog monitoring concluded that operation of WCGS did not appreciably increase fogging incidents from that measured before operation. 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 CCL on fog occurrence along U.S. Highway 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 have been satisfied.

During 2018, there were no reports of fogging incidents in the vicinity of nearby U.S. Highway 75 from individuals or local agencies responsible for traffic safety. Periodic fogging likely caused by the cooling lake did occur during the winter months of 2018, but was restricted to the plant site and immediate vicinity of the lake. 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 CCL. 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 in September 1985.

Transmission line surveys were conducted from 1983 through 1988. Monitoring of lake use by waterfowl, waterbirds, and bald eagles continued through 1996. By then, sufficient data had been collected to determine waterfowl, waterbird, and bald eagle usage of CCL. Consequently, the scope of the wildlife monitoring program was reduced. The current program consists of reviewing CCL waterfowl and bald eagle survey data collected by the Kansas Department of Wildlife, Parks and Tourism (KDWPT). If review of the KDWPT's data indicates that usage has increased from that previously documented, then additional monitoring may be initiated, if warranted.

Review of waterfowl and bald eagle monitoring data for 2018 collected by the KDWPT indicate that waterfowl and waterbird usage was consistent with past years. Increased transmission line collision potential was not indicated. No disease outbreaks or widespread crop depredation attributable to waterfowl use of CCL were observed. 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. In 2014, all cropland was converted to no-till agriculture and cover crops were incorporated into the crop rotation. An environmental education area was improved and maintained as part of the land management program. The land management program continues 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]

Plant design or operational changes were evaluated for potential significant effects to the environment, the presence of which would constitute an unreviewed environmental question (UEQ) per the EPP. Evaluations completed during 2018 demonstrate that significant impacts to the environment would not occur, and that no changes constituted a UEQ. Below are brief descriptions of these evaluations completed in 2018.

1. Security upgrade to three of the on-site x-ray screening machines.

   CP 020058, Rev 0 provides Engineering approval for replacement of CQXRAYUNIT1 and CQXRAYUNIT2 in the Primary Access Facility and CQXRAYUNIT4 in the Secondary Access Facility.

   The scope of this change package is the purchase of 3 new x-ray screening machines that are Smiths-Heimann HI-SCAN 6040-2Is units.

   a. Radiation-producing device considerations

2. Installation of chemical injection lines that will allow manual feed of NALCO H150M biocide to the internal pipe casing and the internal of the discharge pipe for the backup jockey fire pump (1FP003P).

   The scope of this change package will treat the pump suction and discharge in effort to reduce impact of zebra mussel, asiatic clam, and bryozoan accumulation that could adversely affect pump performance. The chemical injection addition will be a tap from the existing biocide supply line 1CI007A-1/2 north of the backup jockey fire pump.

   a. Nonradiological liquid effluent considerations

3. Nalco's new copper corrosion inhibitor 3D Trasar 3DT199 for use in the Service Water (EA) and Essential Service Water (EF) systems

   The scope of this change package will evaluate a substitute product Nalco 3D Trasar 3DT199, used as an alternative Copper Alloy Corrosion Inhibitor, will be the replacement equivalent provided by Nalco in the future to replace 3DT197.

   a. Nonradiological liquid effluent considerations

4. Approve the design and support the pre-construction infrastructure requirements for the Independent Spent Fuel Storage Installation (ISFSI) Main Access Facility (MAF) Security Building and associated parking lot.

   The scope of this change package also includes approving the design and installation of portions of the Fire Protection System in the area around the MAF, and the design and installation of buried concrete ductbanks required for the MAF fiber optic cables, electrical, and communication needs. This CP authorizes excavation, removal and relocation of existing portions of the Fire Protection System.

   a. Nonradiological solid waste considerations

5. Implementing changes to the plant design and configuration to allow for construction of an Independent Spent Fuel Storage Installation (ISFSI) facility. The ISFSI facility will provide the capability for on-site dry cask storage of spent fuel.

   This scope includes construction of the Main Access Facility, a sally port and a new parking lot under project number 501555. The new building and sally port will be located west of the William Allen White building.

   a. Nonradiological solid waste considerations
   b. Stormwater considerations

6. Installation of surface grading, drainage and the new parking lot associated with the new Main Access Facility.

   a. Nonradiological solid waste considerations
   b. Stormwater considerations

7. The construction of the Security Main Access Facility building design controlled features is being implemented under this change package, CP 020062. CP 020062, addresses the location, construction, and testing of a new Security MAF building, Z130, including a new sally port and the required security features.

   a. Nonradiological liquid effluent considerations
   b. Clean air program considerations

c. Nonradiological solid waste considerations
d. Hazardous waste considerations
e. Radiation-producing device considerations
f. Above ground storage tank considerations
g. SPCC considerations
h. Stormwater considerations
i. Refrigerant Management Program

8. Replacing ESF Transformer XNB01 with a new transformer

This scope includes replacing ESF Transformer XNB01 with a new transformer that will fit on the existing foundation, utilize existing power and control cables at the same location. The volume of oil present in the new transformer is greater than the old unit, with a total capacity of 4,440 gallons. The existing XNB01 oil containment vault has a capacity of 1,605 cubic feet, which is sufficient to contain 100% of the transformer oil volume and a minimum 10-minute discharge of the water spray system in accordance with NEIL Loss Control Manual.

a. SPCC considerations

3.2 NON-ROUTINE ENVIRONMENTAL REPORTS [EPP Section 5.4.2]

3.2.1 Submitted Non-routine Reports

There were no environmental reports involving significant non-routine impacts submitted to the NRC during 2018.

3.2.2 Unusual or Important Environmental Event Evaluations [EPP Section 4.1]

No unusual or important environmental events that indicated or resulted in a significant environmental impact related to plant operations occurred during 2018.