BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the 2023 Wolf Creek Triennial Decommissioning Financing Plan.	)))	Docket No. 23-WCNE-235-GIE

JOINT PLEADING REGARDING DECOMMISSIONING FINANCING PLAN

COME NOW the Wolf Creek Nuclear Operating Corporation ("WCNOC"), Evergy Metro, Inc. d/b/a Evergy Kansas Metro [f/k/a Kansas City Power & Light Company]("Evergy Kansas Metro"), Evergy Kansas Central, Inc. [f/k/a Westar Energy, Inc.] and Evergy Kansas South, Inc. [f/k/a Kansas Gas and Electric Company] (collectively referred to herein as "Evergy Kansas Central");" and all three collectively referred to herein as "Companies")[1], and Kansas Electric Power Cooperative, Inc. ("KEPCo") (collectively referred to as the "Parties") and jointly submit to the State Corporation Commission for the State of Kansas ("Commission") the following pleading concerning the Decommissioning Financing Plan ("Plan") for the Wolf Creek Generating Station ("Wolf Creek"). Such Plan includes the 2023 triennial Decommissioning Cost Study for Wolf Creek.

I. RELEVANT STATUTES

1. K.S.A. 66-128m requires a decommissioning financing plan. Pursuant to K.S.A. 66-128o, the Commission shall review the decommissioning financing plan for each nuclear power generating facility located in the State of Kansas at least every five years until the facility's closing and at least annually after the closing. Such review may include any and all aspects of the decommissioning financing plan.

[1] Effective October 8, 2019, Evergy Metro, Inc. d/b/a Evergy Kansas Metro adopted the service territory and tariffs of KCP&L; *Order Approving Name Change*, Docket No. 20-KCPE-122-CCN, dated October 8, 2019. Effective October 8, 2019, Evergy Kansas Central, Inc. and Evergy Kansas South, Inc. d/b/a collectively as Evergy Kansas Central adopted the service territory and tariffs of Westar; *Order Approving Name Change*, Docket No. 20-WSEE-123-CCN, dated October 8, 2019.

II. BACKGROUND

2. On August 29, 2014, WCNOC filed its 2014 Decommissioning Cost Analysis for Wolf Creek, in accordance with the Commission's December 9, 1992 Order in Docket No. 163,561-U and the Commission's Order in Docket No. 13-WCNE-204-GIE on June 13, 2013. The December 9, 1992 Order directed the filing of a decommissioning cost study every three years after September 1, 1993. The June 13, 2013 Order directed WCNOC and the owning utilities to update the estimates of the total capital costs of the Independent Spent Fuel Storage Installation ("ISFSI") project at Wolf Creek as part of the triennial decommissioning cost study filings.[2]

3. On August 29, 2014, the Parties filed a 2014 Wolf Creek decommissioning cost analysis in Docket 15-WCNE-093-GIE.

4. In that docket, the Parties and Staff entered into a Stipulation and Agreement ("S&A") for the purpose of determining a reasonable estimate of Wolf Creek decommissioning costs to be used in addressing accrual levels of the respective owner utilities' decommissioning trust accounts and the appropriate escalation factor (inflation rate). Although CURB is not a signatory to the S&A, CURB did not oppose the S&A.

5. The Order Approving the Unopposed S&A was approved by the Commission on March 24, 2015.

6. During settlement negotiations, the Parties, Staff and CURB also discussed a separate, future issue regarding the content of the 2017 triennial decommissioning cost study filing. The Parties, Staff and CURB agreed to continue discussions regarding the appropriate content for future triennial filings in order to ensure that such filings were consistent with the

[2] *See* Docket No. 13-WCNE-204-GIE, In the Matter of a Generic Proceeding Regarding Wolf Creek Nuclear Operating Corporation to Receive Information Concerning Spent Fuel, Pursuant to the Commission's May 12, 2012 Order in Docket No. 12-WCNE-136-GIE, *Order Closing Docket*, issued Jun. 13, 2013, Ordering ¶ A.

requirements in the Kansas statute. Under the terms of the S&A, the Parties and Staff were required to report to the Commission as to the status of discussions to resolve the separate issue regarding the appropriate content of the 2017 triennial filing on or before February 15, 2016.[3] Then, on or before September 1, 2016, the Parties were required to file a resolution of the issue regarding appropriate content for the September 1, 2017 triennial filing with the Commission for approval.[4]

III. JOINT RESOLUTION

7. Following the Commission's Order on March 24, 2015, the Parties, Staff and CURB held a number of conference calls to discuss the issues and what the utilities should file by September 1, 2017 for the next triennial Wolf Creek Decommissioning Cost Docket.

8. As a result of those calls, the Parties and CURB filed a Joint Status Report and Resolution on February 5, 2016. The Parties reached agreement regarding the format for the information to be included in the Wolf Creek owners' triennial filing and that agreement is reflected in the Joint Resolution, attached hereto as **Attachment 1**.

9. The Joint Resolution was approved by the Commission on May 5, 2016 in Docket 15-WCNE-093-GIE.

10. The Parties have followed the same format used in the September 1, 2017 Triennial filing for the instant filing.

IV. COMPONENTS OF PLAN

11. The components of the Plan are summarized briefly below.

[3] *See S&A*, pp. 2-3, ¶8.
[4] *Id.*

12. **Attachment 2-**Triennial Wolf Creek Decommissioning Cost Study. The Decommissioning Cost Study was prepared by TLG Services, Inc. and contains a 2023 decommissioning cost estimate for selected decommissioning alternatives.

13. **Attachment 3-**Escalation Rate, Estimated Cost at Decommissioning. The testimony of Brett Lovell sets forth the escalation rate and estimated cost at decommissioning. Each utility owner has also provided the total amount of money which customers of each utility have been charged for decommissioning to date and the total amount necessary to meet the projected decommissioning costs over Wolf Creek's remaining useful life.

14. **Attachment 4-**Utility Funding Plans. Although the funding plans of each utility owner are based on the total decommissioning cost, each plan is necessarily based on each utility's specific ownership share as well as other utility specific information. Each utility owner funding plan is part of the overall funding plan. Each owner has prepared a spreadsheet with its funding plan, an explanation of future contribution levels, the tax status of the decommissioning funds and investment guidelines.

15. **Attachment 5-**Financial Responsibility. Copies of the existing ownership and operating agreements are provided as an exhibit in Attachment 5. Each owner has provided documentation of the applicability of the agreement to decommissioning financial responsibility.

16. **Attachment 6-**Periodic Review. The owners will continue to periodically review the Decommissioning Financing Plan and update the Commission every three years.

17. **Attachment 7-**Commission Requested Information. This information is found in Attachment 7.

WHEREFORE, the Parties submit this Joint Pleading in compliance with the Commission's May 5, 2015 Order as the appropriate format for the September 1, 2023 triennial

filing to meet the requirements of K.S.A. 66-128o for review of the financial plan for Wolf Creek decommissioning and accept it as the final resolution of all outstanding issues in this docket, and for any further relief the Commission shall deem just and appropriate.

Respectfully submitted,

/s/ Cathryn J. Dinges
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Roger W. Steiner (#26159)
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COUNSEL FOR KEPCO

BEFORE THE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the 2023 Wolf Creek Triennial Decommissioning Financing Plan.	)))	Docket No. 23-WCNE-____-GIE

AFFIDAVIT OF CATHRYN J. DINGES

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Cathryn J. Dinges, being first duly sworn on her oath, states:

1. My name is Cathryn J. Dinges. I work in Topeka, Kansas, and I am employed by Evergy, Inc. as Corporate Counsel.

2. I have read the foregoing and know the contents thereof, and that the facts set forth herein are true and correct to the best of my knowledge and belief.

Cathryn J. Dinges

Subscribed and sworn before me this 1st day of September 2023.

Notary Public

My commission expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

BEFORE THE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the 2023 Wolf Creek Triennial Decommissioning Financing Plan.	)))	Docket No. 23-WCNE-____-GIE

AFFIDAVIT OF ROGER W. STEINER

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Roger W. Steiner, being first duly sworn on his oath, states:

1. My name is Roger W. Steiner. I work in Kansas City, Missouri, and I am employed by Evergy, Inc. as Corporate Counsel.

2. I have read the foregoing and know the contents thereof, and that the facts set forth herein are true and correct to the best of my knowledge and belief.

Roger W. Steiner

Subscribed and sworn before me this 1st day of September 2023.

Notary Public

My commission expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

BEFORE THE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the 2023 Wolf Creek Triennial Decommissioning Financing Plan.	)))	Docket No. 23-WCNE-____-GIE

STATE OF KANSAS)
) ss.
COUNTY OF SHAWNEE)

I, Susan B. Cunningham, verify under penalty of perjury that I have assisted in the preparation of the foregoing *Joint Pleading Regarding Decommissioning Financing Plan* ("Joint Pleading") on behalf of Kansas Electric Power Cooperative, Inc.; that I have read and reviewed the Joint Pleading; and that the contents thereof are true and correct to the best of my information, knowledge, and belief.

Susan B. Cunningham

Susan B. Cunningham

Subscribed and sworn before me this 1st day of September 2023.

Lindsay Cottrell Clark

Notary Public

My commission expires: 9-9-2026

NOTARY PUBLIC - State of Kansas
LINDSAY COTTRELL CLARK
My Appt. Expires 9-9-2026

CERTIFICATE OF SERVICE

I, the undersigned, hereby certify that a true and correct copy of the above was electronically served, hand-delivered or mailed, postage prepaid, this 1st day of September 2023 to:

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/s/ Roger W. Steiner
Roger W. Steiner

ATTACHMENT 1

Joint Resolution

JOINT RESOLUTION

The Staff of the State Corporation Commission of the State of Kansas ("Staff" and "Commission," respectively), Wolf Creek Nuclear Operating Corporation ("Wolf Creek"), Kansas Gas and Electric Company d/b/a Westar Energy ("Westar"), Kansas City Power & Light Company ("KCP&L"), Kansas Electric Power Cooperative, Inc. ("KEPCo") (collectively referred to as the "Parties") hereby resolve that the owners of the Wolf Creek Nuclear Operating Station ("Station") shall update the Decommissioning Financing Plan ("Plan") for such Station by filing a comprehensive updated Plan by September 1, 2017 for Commission review under K.S.A. 66-128o. Such updated Plan shall include the following sections including updates to the components of the Wolf Creek Plan as listed in 66-128m, Section (b).

I. Joint Pleading (Utility Owners).
Joint Pleading discussing the history of this docket, and why this Plan is being comprehensively updated at this time. Include references to statutes and prior Commission Orders regarding periodic review of the Plan. Include discussion of components of filing as listed below.

II. Triennial Wolf Creek Decommissioning Cost Study by TLG (or other contractor)
Such Study will include:
   a. An estimate of the date of closing of the nuclear power generating facility (1)[1];
   b. An estimate of the cost of decommissioning the facility, expressed in dollars current in the year the Plan is prepared, and based on an engineering report issued within three years of the date the Plan is submitted to the Commission (2); and
   c. A description of the stages by which decommissioning is intended to be accomplished (9).

III. Escalation Rate, Estimated Cost at Decommissioning
Recommendation and supporting testimony for escalation rate for decommissioning cost. Include estimated decommissioning cost at 2045 given Cost Study with application of recommended escalation rate, and the share of the estimated decommissioning costs attributed to each owner (3). Also include the amount of money which customers of each owner utility have been charged for the decommissioning up to the date of submission of the Plan and the total amount necessary to meet the projected decommissioning costs of the facility, over the remaining useful life of the facility (6).

IV. Utility Funding Plans (4)
Individual Owner utility currently approved Annual Contributions and schedules for collection of the estimated decommissioning costs through final decommissioning of the

[1] The parentheticals noted throughout the Joint Resolution refer to the eleven numbered items under K.S.A. 66-128m(b).

Station. Include discussion of process for each utility to update its Annual Contribution level through Commission action. Also discuss tax status of decommissioning funds and other relevant fund information, such as investment guidelines, etc. This should include an overall section and a section for each utility owner.

V. Financial Responsibility

a. A fully executed decommissioning financing agreement between the licensee and each owner, evidencing each owner's acceptance of its respective share of the ultimate financial responsibility for decommissioning. In satisfaction of this requirement, the licensee may submit existing ownership agreements together with documentation from each owner of the applicability of the agreement to the case of financial responsibility for decommissioning (10). (Include ownership and operating agreements as (confidential) appendices.)
b. Plans and options for insuring against or otherwise financing premature closing of the facility (7), including but not limited to:
    i. Plan/options to ensure that the contribution amount set for the decommissioning trust fund for each owner is reasonable given the possibility for premature closing;
    ii. Options to address the potential for a decommissioning trust fund shortfall in the event of premature closing;
    iii. Plan/options to address recovery of depreciation expense for Wolf Creek by the owners; and
    iv. Discussion of regulatory treatment and rate recovery options that would ensure that owners fully recover their investment and return on their investment even in the event of a premature closing including rate adjustments in current rate periods or continued rate recovery after the plant is closed.
c. Reasonable assurance of responsibility in the event of insufficient assets to fund the decommissioning (8).

VI. Periodic Review

Plans for continued periodic review and updating of the Plan, including the estimated cost of decommissioning (5).

VII. Commission Requested Information

Other information related to the financing of decommissioning which the Commission requests (11):

a. Department of Energy (DOE) fund;
b. DOE lawsuit history;
c. Decommissioning efforts to date for U.S. nuclear plants including

i. decommissioning methods employed;
ii. reason for decommissioning if performed prior to end of plant life expectancy;
iii. actual cost of decommissioning;
iv. comparison of actual cost of decommissioning to previous decommissioning cost estimates for plant.

d. Independent Spent Fuel Storage Installation (ISFSI) – timing, legal and other issues; and
e. Other spent fuel discussion, as appropriate.

ATTACHMENT 2

Decommissioning Cost Study

DECOMMISSIONING COST ANALYSIS

for the

WOLF CREEK GENERATING STATION

prepared for

Wolf Creek Nuclear Operating Corporation

prepared by

TLG Services, LLC
Bridgewater, Connecticut

August 2023

APPROVALS

Project Manager	Corey J. Munz	8/18/2023 Date
Project Engineer	Christopher R. Koriniskie	8/18/2023 Date
Technical Manager	Adam M. Kaczmarek	8/18/2023 Date

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REVISION LOG

No.	Date	Item Revised	Reason for Revision
0	06-29-2023	-	Original Issue
1	8-18-2023	References, Appendix F, Appendix G	Editorial revision

EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Wolf Creek Generating Station (Wolf Creek) for the selected decommissioning alternatives following the scheduled and permanent cessation of plant operations. Wolf Creek is operated by Wolf Creek Nuclear Operating Corporation (WCNOC). Wolf Creek's three owners are Kansas Gas and Electric Company, a wholly owned subsidiary of Westar Energy, Inc., Kansas City Power & Light Company, a wholly owned subsidiary of Great Plains Energy Incorporated, and Kansas Electric Power Cooperative, Inc. The estimates are designed to provide WCNOC and its owners with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2020,[1] updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency), and site restoration requirements.

As discussed in the 2020 estimate, developments in the area of spent nuclear fuel disposal suggest a possibility that the federal government may not have removed all of Wolf Creek's spent nuclear fuel and high-level radioactive waste (hereafter, simply "spent fuel") from the station by the time the plant is ready for decommissioning. As-such, this estimate will treat the scenario where the spent fuel remains on site for an extended period following decommissioning of the power block, as the base case, as it was in 2020.

For continuity and comparison of the 2020 estimate, the five years wet storage with complete transfer to DOE (the 2020 alternate case) is presented in Appendix F, updated to 2023 dollars. There still is much uncertainty in this area. Because the assumptions used in Appendix F analysis are speculative at this point, the hypothetical cost effects shown here have not been included in the overall updated cost estimate in this report.

While the analysis is not a detailed engineering evaluation, it represents the estimates prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear plant. It may also not reflect the actual plan to

1 "Decommissioning Cost Analysis for the Wolf Creek Generating Station," Document W11-1781-001, Rev. 0, TLG Services, Inc., August 2020

decommission Wolf Creek; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2020 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis. There were no substantive changes made to the plant inventory that would impact decommissioning.

The costs to decommission Wolf Creek for the scenarios evaluated are tabulated at the end of this section. Costs are reported in 2023 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

A complete discussion of the assumptions relied upon in this analysis is provided in Section 3, along with schedules of annual expenditures for each scenario. A sequence of significant project activities is provided in Section 4 with a timeline for each scenario. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C and D.

Consistent with the 2020 analysis, the current cost estimates assume that the shutdown of the nuclear plant is a scheduled and pre-planned event (e.g., there is no delay in transitioning the plant and workforce from operations or in obtaining regulatory relief from operating requirements, etc.). The estimates include the continued operation of the fuel building as an interim wet fuel storage facility for approximately four years after operations cease. During this period, it is assumed that the spent fuel residing in the pool will be transferred to the Department of Energy (DOE) or to a newly constructed independent spent fuel storage installation (ISFSI) on the site.

The ISFSI, consisting of transportable storage canisters to house the spent fuel assemblies, and horizontal storage modules, will remain operational until the DOE is able to complete the transfer of the fuel to a federal facility (e.g., a monitored retrievable storage facility).[2] DOE officials have stated that DOE does not have an obligation to accept already-canistered fuel without an amendment to DOE's contracts with plant licensees to remove the fuel (the "Standard Contract"), but DOE has not explained what any such amendment would involve. For purposes of this analysis, it is assumed that DOE will accept already-canistered fuel. If this assumption is incorrect, it is assumed the DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers.

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2 Projected expenditures for spent fuel management identified in the cost analyses do not consider the outcome of the litigation with the DOE with regard to the delays incurred by the owner in the timely removal of spent fuel from the site.

Alternatives and Regulations

The ultimate objective of the decommissioning process is to reduce the inventory of contaminated and activated material such that the license can be terminated. The Nuclear Regulatory Commission (NRC) provided general decommissioning requirements in a rule adopted on June 27, 1988.[3] In this rule, the NRC set forth technical and financial criteria for decommissioning licensed nuclear facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

> DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."[4]
>
> SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."[5] Decommissioning is required to be completed within 60 years, although longer periods will be considered when necessary to protect public health and safety.
>
> ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property."[6] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety.
>
> The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff

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3 U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

4 Ibid. Page FR24022, Column 3

5 Ibid.

6 Ibid. Page FR24023, Column 2

> to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred pending the completion of additional research studies (e.g., on engineered barriers).
>
> In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposed removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to its general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.[7] The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, (as revised in October 2013), further described the methods and procedures that are acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued February 2005.[8]

In 2011, the NRC issued regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.[9] The regulations require licensees to report additional details in their decommissioning cost estimate, including a decommissioning estimate for the ISFSI. This estimate is provided in Appendix E.

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7 U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61, (p 39278 et seq.), July 29, 1996

8 "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005

9 U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011

Decommissioning Scenarios

Two decommissioning scenarios were evaluated for Wolf Creek. The scenarios selected are representative of alternatives available to the owner and are defined as follows:

1. The first scenario assumes that the plant would be promptly decommissioned (DECON alternative) upon the expiration of the current operating license, i.e., in 2045. All remaining spent fuel in the plant's spent fuel storage pool is transferred to the DOE or to the onsite ISFSI within the first four years. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Site structures are then demolished. Spent fuel storage operations continue at the site until the transfer of the fuel from the ISFSI to the DOE is complete, assumed to be in the year 2078.

2. In the second scenario, the nuclear plant is placed into safe-storage (SAFSTOR alternative) at the end of its current operating license. All remaining spent fuel in the plant's spent fuel storage pool is transferred to the DOE or to the onsite ISFSI and the plant reconfigured for long-term storage. Spent fuel storage operations continue at the site until the transfer of the fuel from the ISFSI to the DOE is complete, assumed to be in the year 2078. Decommissioning operations commence in 2098, with the decontamination and dismantling of Wolf Creek completed in 2105, sixty years after the cessation of operations. Site structures are then demolished, with site restoration to be complete in 2106.

Methodology

The methodology used to develop the estimates follows the basic approach originally presented in the cost estimating guidelines[10] developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this analysis incorporate site-specific costs and the latest available information about worker productivity in decommissioning.

An activity duration critical path is used to determine the total decommissioning program schedule. This is required for calculating the carrying costs, which include program management, administration, field engineering, equipment rental, quality assurance, and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

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10 T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

The estimates also reflect lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells and associated facilities, completed in 1997. In addition, the planning and engineering for the Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee, Fort Calhoun, Pilgrim and Indian Point nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."[11] The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the plant.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Management

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is generally classified as low-level radioactive waste, although not all of the material is suitable for shallow-land disposal. With the passage of the "Low-Level Radioactive Waste Disposal Act" in 1980 and its Amendments of 1985, [12] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

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11 Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239.

12 "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, January 15, 1986

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS), located in Andrews, Texas. The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to WCNOC. The majority of the low-level radioactive waste designated for controlled disposal (Class A[13]) can be sent to Energy*Solutions*' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon WCNOC's "Long Term Waste Disposal Agreement" with Energy*Solutions*. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste is assumed to be shipped to the WCS facility for disposal. Disposal costs are based upon preliminary and indicative information for the WCS site.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste.

The DOE issued its final Environmental Impact Statement for the disposal of GTCC on January 2016.[14] The study evaluated the potential environmental impacts associated with constructing and operating a new facility or using an existing facility, disposal methods, and locations. DOE is awaiting Congressional action on the report and its recommendations. At this time, the federal government has not identified a specific cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis only, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in canisters compatible with the spent fuel dry storage system and either stored on site or shipped directly to a federal facility as it is generated (depending upon the timing of the

13 Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55
14 "Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste (DOE/EIS-0375)," January 2016

decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act"[15] (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. The DOE was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, despite DOE's submittal of its License Application for a geologic repository to the NRC in 2008. The Obama administration eliminated the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle … and make recommendations for a new plan."[16] Towards that goal, the Obama administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter included a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."[17]

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

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15 "Nuclear Waste Policy Act of 1982 and Amendments," DOE's Office of Civilian Radioactive Management, 1982

16 "Advisory Committee Charter, Blue Ribbon Commission on America's Nuclear Future," Appendix A, January 2012

17 Ibid.

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"[18]
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."[19]

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."[20] This document states:

"With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."[21]

The NRC's review of DOE's license application to construct a geologic repository at Yucca Mountain was suspended in 2011, when the Obama administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)[22] ordering NRC to comply with federal law and resume its review of DOE's Yucca Mountain repository license application to the extent allowed by previously

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18 "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," http://www.brc.gov/sites/default/files/documents/brc_finalreport_jan2012.pdf, p. 32, January 2012

19 Ibid., p.27

20 "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013

21 Ibid., p.2

22 U.S. Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, Aug. 2013

appropriated funding for the review. That review was completed with the publication of a five-volume safety evaluation report. A supplement to DOE's environmental impact statement and adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made. Although the DOE proposed it would start fuel acceptance in 2025, no progress has been made in the repository program since DOE's 2013 strategy was issued except for the completion of the Yucca Mountain safety evaluation report.

Holtec International submitted a license application to the NRC on March 30, 2017 for a consolidated interim spent fuel storage facility in southeast New Mexico called HI-STORE CIS (Consolidated Interim Storage) under the provisions of 10 CFR Part 72. The application is currently under NRC review.

Waste Control Specialists submitted an application to the NRC on April 28, 2016, to construct and operate a Consolidated Interim Storage Facility (CISF) at its West Texas facility. On April 18, 2017, WCS requested that the NRC temporarily suspend all safety and environmental review activities, as well as public participation activities associated with WCS's license application. In March 2018, WCS and Orano USA, announced their intent to form a joint venture to license the facility. The joint venture, named Interim Storage Partners (ISP), requested that the NRC resume its review of the original CISF license application. Subsequently, in September, 2021, NRC issued a license to ISP for its WCS CISF to construct and operate the facility for spent nuclear fuel and GTCC storage. However, the facility is not yet operational.

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program had originally assumed that spent fuel allocations would be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.[23] However, the Blue Ribbon Commission, in its final report, noted that: "[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. …. The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears

[23] U.S. Code of Federal Regulations, Title 10, Part 961.11, Article IV – Responsibilities of the Parties, B. DOE Responsibilities, 5.(a) … DOE shall issue an annual acceptance priority ranking for receipt of SNF and/or HLW at the DOE repository. This priority ranking shall be based on the age of SNF and/or HLW as calculated from the date of discharge of such materials from the civilian nuclear power reactor. The oldest fuel or waste will have the highest priority for acceptance …"

to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first."

WCNOC's current spent fuel management plan for the Wolf Creek spent fuel is based in general upon: a 2031 start date for DOE initiating transfer of commercial spent fuel from the currently operating units to a licensed facility, and expectations for spent fuel receipt by the DOE for the Wolf Creek fuel.

Assuming the DOE starts accepting fuel from the currently operating plants in 2031, and from Wolf Creek in 2038, and a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year,[25] transfer of spent fuel from the ISFSI is anticipated to continue through the year 2078, if the plant ceases operating in 2045.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE. [24] Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel building's storage pool as well as at an on-site ISFSI.

An ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K [25]), supports decommissioning operations. Spent fuel stored in the existing storage pool will be transferred to the DOE first, followed by transfer of the fuel in dry storage canisters at the ISFSI. With the storage pool emptied, the fuel building can be either decontaminated and dismantled or prepared for long-term storage.

WCNOC's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim.

Sensitivity of Spent Fuel Management Assumptions

The estimates described in this analysis were developed with the assumption that the DOE would accept spent fuel from generators in the order in which it was generated or oldest fuel first, and that the ISFSI is used for interim storage, similar to what has occurred at recently decommissioned reactor sites. To support the decommissioning program, the ISFSI would be used for the interim storage of the fuel so that decommissioning could proceed on the power block structures.

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24 U.S. Code of Federal Regulations, Title 10, Part 50 – Domestic Licensing of Production and Utilization Facilities, Subpart 54 (bb), "Conditions of Licenses"

25 U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites."

It should also be noted that the additional costs for purchase and operation of the ISFSI, while incurred by the licensee, may also be recoverable as a result of DOE's breech of its contract to take possession of the spent fuel in a timely manner.

If DOE is able to give priority to removing spent fuel from shutdown sites, the spent fuel could be removed from the Wolf Creek site within five and one-half years of the cessation of plant operations (i.e., five and one-half years would provide sufficient cooling time for the spent fuel to meet DOE transportation requirements).

Appendix F evaluates such a scenario (i.e., where spent fuel is accepted from shutdown reactors first). The resulting costs for short-term fuel pool spent fuel management (summarized in Table F) are illustrative only and based upon current regulations and associated constraints that may change as a result of actions taken on the Blue Ribbon Commission's recommendations. However, the analysis described in Appendix F may prove useful as an alternate planning basis should changes occur in the policies involving the national solution for the disposition of spent fuel and high-level waste.

Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process is deferred.

Consequently, this study assumes that non-essential site structures addressed by this analysis are removed, once remediation is complete, to a nominal depth of three feet below the local grade level wherever possible. The site is then graded and stabilized.

Summary

The estimates to decommission Wolf Creek assume the removal of all contaminated and activated plant components and structural materials such that the owner may then have unrestricted use of the site with no further requirements for an operating license. Low-level radioactive waste, other than GTCC waste, is sent to a commercial processor for treatment/conditioning or to a controlled disposal facility.

Decommissioning is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such

time that the transfer to a DOE facility is complete. Once emptied, the storage facility can also be decommissioned.

The decommissioning scenarios are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated work force requirements delineated in Appendices C and D. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates for the DECON and SAFSTOR alternatives are assigned to one of three subcategories: NRC License Termination (radiological remediation), Spent Fuel Management, and Site Restoration. The subcategory "NRC License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the unit's operating license, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.4.1 provides the basis for the ISFSI decommissioning cost.

The "Spent Fuel Management" subcategory is used to accumulate costs associated with the containerization and transfer of spent fuel from the wet storage pool to the DOE, as well as the eventual transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pool and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any costs related to the final disposal of the spent fuel.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, an owner may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those

costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2023 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

DECON COST SUMMARY
DECOMMISSIONING COST ELEMENTS
(thousands of 2023 dollars)

Cost Element	Total
Decontamination	21,211
Removal	151,865
Packaging	35,868
Transportation	20,538
Waste Disposal	99,268
Off-site Waste Processing	32,560
Program Management [1]	297,023
Site Security	238,025
Spent Fuel Pool Isolation	16,480
Spent Fuel Management - Direct Costs [2]	124,802
Insurance and Regulatory Fees	35,382
Energy	13,613
Characterization and Licensing Surveys	21,048
Property Taxes	51,584
Miscellaneous Equipment	8,467
Corporate Allocations	3,628
Total [3]	1,171,364

Cost Element	Total
License Termination	736,220
Spent Fuel Management	364,576
Site Restoration	70,567
Total [3]	1,171,364

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

SAFSTOR COST SUMMARY
DECOMMISSIONING COST ELEMENTS
(thousands of 2023 dollars)

Cost Element	Total
Decontamination	18,481
Removal	164,663
Packaging	22,550
Transportation	17,141
Waste Disposal	74,292
Off-site Waste Processing	36,400
Program Management [1]	461,712
Site Security	360,895
Spent Fuel Pool Isolation	16,480
Spent Fuel Management - Direct Costs [2]	115,757
Insurance and Regulatory Fees	63,335
Energy	34,207
Characterization and Licensing Surveys	23,470
Property Taxes	81,735
Miscellaneous Equipment	26,960
Corporate Allocations	6,633
Total [3]	1,524,712

Cost Element	Total
License Termination	1,133,530
Spent Fuel Management	318,571
Site Restoration	72,611
Total [3]	1,524,712

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

1. INTRODUCTION

This report presents estimates of the cost to decommission the Wolf Creek Generating Station (Wolf Creek) for the selected decommissioning scenarios following the scheduled cessation of plant operations. Wolf Creek is operated by Wolf Creek Nuclear Operating Corporation (WCNOC). Wolf Creek's three owners are Kansas Gas and Electric Company, a wholly owned subsidiary of Westar Energy, Inc., Kansas City Power & Light Company, a wholly owned subsidiary of Great Plains Energy Incorporated, and Kansas Electric Power Cooperative, Inc. The estimates are designed to provide the WCNOC and its owners with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2020,[1]* updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency), and site restoration requirements.

The analysis is not a detailed engineering evaluation, but rather an estimate prepared in advance of the detailed engineering required to carry out the decommissioning of the nuclear plant. It may also not reflect the actual plan to decommission Wolf Creek; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2020 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis. There were no substantive changes made to the plant inventory, that would impact decommissioning.

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the costs to decommission Wolf Creek, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities.

An operating license was originally issued for Wolf Creek in June of 1985. A license renewal application was filed for the nuclear station in October 2006.

* References provided in Section 7 of the document

The NRC approved the application and a renewed licensed was issued in November 2008. As such, this analysis is based upon a 60-year operating life, with a final shutdown date (license expiration) in March of 2045.

1.2 SITE DESCRIPTION

The Wolf Creek site is located approximately 3.5 miles northeast of the town of Burlington, in Coffey County, Kansas, approximately 75 miles southwest of Kansas City, Kansas. The site is on the east side of a manufactured lake formed by impounding Wolf Creek. The station is a 1,170 MWe (nominal) pressurized water reactor with supporting facilities.

Westinghouse Electric Company designed the Nuclear Steam Supply System (NSSS). The system consists of a pressurized water reactor with four independent primary coolant loops, each of which contains a reactor coolant pump and a steam generator. An electrically heated pressurizer and connecting piping complete the system. The NSSS is rated at a thermal power level of 3,579 MWt (3,565 MWt reactor core plus 14 MWt for reactor coolant pumps), with a corresponding turbine-generator gross output of 1,267 MWe. The system is housed within a containment structure, a pre-stressed, post-tensioned concrete structure with cylindrical wall, a hemispherical dome, and a flat foundation slab. The wall and dome form a pre-stressed post-tensioned system. The inside surface of the structure is covered with a carbon steel liner, providing a leak tight membrane.

A power conversion system converts heat produced in the reactor to electrical energy. This system converts the thermal energy of the steam into mechanical shaft power and then into electrical energy. The turbine-generator is a tandem-compound, six-flow, four element, 1800-rpm unit. The unit consists of one high pressure and three low-pressure turbine elements driving a directly coupled generator. (The four turbine elements were replaced in 2010 with very similar equipment.) The turbine is operated in a closed feedwater cycle that condenses the steam; the feedwater is returned to the steam generators. Heat rejected in the main condensers is removed by the circulating water system.

The circulating water system supplies cooling water to the main condenser, condensing the steam exhausted from the turbine. A large cooling lake provides the heat sink required for removal of waste heat in the power plant thermal cycle.

1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.[2] This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors,"[3] which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations, while the SAFSTOR and ENTOMB alternatives defer the process.

The rule also placed limits on the time allowed to complete the decommissioning process. For all alternatives, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. At the conclusion of a 60-year dormancy period (or longer if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking permitting the controlled release of a site,[4] the NRC did re-evaluate the alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.[5] However, the NRC's staff has subsequently recommended that rulemaking be deferred, based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities), at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants.[6] When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices, along with related changes to Technical Specifications, entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Prior to or within 2 years following permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC, and a copy to the affected State(s) (10 CFR 50.82(a)(4)(i)). The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which includes a license termination plan (LTP).

In 2011, the NRC issued regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.[7] The regulations require licensees to report additional details in their decommissioning cost estimate including a decommissioning estimate for the ISFSI. This estimate is provided in Appendix E.

1.3.1 High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982,[8] assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. It was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, despite DOE's submittal of its License Application for a geologic repository to the NRC in 2008. The Obama administration eliminated the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle … and make recommendations for a new plan." Towards this goal, the Obama administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter included a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."[9]

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- "[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities"
- "[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste."[10]

In January 2013, the DOE issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," in response to the recommendations made by the Blue Ribbon Commission and as "a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel..."[11]

"With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."

The NRC's review of DOE's license application to construct a geologic repository at Yucca Mountain was suspended in 2011, when the Obama administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)[12] ordering NRC to comply with federal law and resume its review of DOE's Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review was completed with the publication of a five-volume safety evaluation report. A supplement to DOE's environmental impact statement and adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made. Although the DOE proposed it would start fuel acceptance in 2025, no progress has been made in the repository program since DOE's 2013 strategy was issued except for the completion of the Yucca Mountain safety evaluation report.

Holtec International submitted a license application to the NRC on March 30, 2017 for a consolidated interim spent fuel storage facility in southeast New Mexico called HI-STORE CISF (Consolidated Interim Storage Facility) under the provisions of 10 CFR Part 72. In May 2023, the NRC

issued a license to Holtec to construct and operate a facility to receive, possess, store, and transfer spent nuclear fuel at the HI–STORE CISF.

Waste Control Specialists submitted an application to the NRC on April 28, 2016, to construct and operate a Consolidated Interim Storage Facility (CISF) at its West Texas facility. On April 18, 2017, WCS requested that the NRC temporarily suspend all safety and environmental review activities, as well as public participation activities associated with WCS's license application. In March 2018, WCS and Orano USA, announced their intent to form a joint venture to license the facility. The joint venture, named Interim Storage Partners (ISP), requested that the NRC resume its review of the original CISF license application. Subsequently, in September, 2021, NRC issued a license to ISP for its WCS CISF to construct and operate the facility for spent nuclear fuel and GTCC storage. However, the facility is not yet operational.

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program had originally assumed that spent fuel allocations would be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.[13] However, the Blue Ribbon Commission, in its final report, noted that: "[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. …. The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first."

WCNOC's current spent fuel management plan for the Wolf Creek spent fuel is based in general upon: 1) a 2031 start date for DOE initiating transfer of commercial spent fuel to a federal facility, and 2) a 2038 start date for the transfer of spent fuel from the Wolf Creek site based on an oldest fuel first priority, and the DOE achieving an annual rate of transfer (3,000 metric tons of uranium per year) as reflected in DOE's latest Acceptance Priority Ranking and Annual Capacity Report.[14] Transfer of spent fuel from the ISFSI is anticipated to continue through the year 2078, with plant operations ceasing in 2045.

The NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.[15] Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel building storage pool as well as at an on-site ISFSI.

The ISFSI, operated under a Part 50 General License (in accordance with 10 CFR 72, Subpart K[16]), supports decommissioning operations. Spent fuel stored in the existing storage pool will be transferred to the DOE first, followed by transfer of the fuel in dry storage canisters at the ISFSI. With the storage pool emptied, the fuel building can be either decontaminated and dismantled or prepared for long-term storage.

WCNOC's position is that the DOE has a contractual obligation to accept the spent fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim.

1.3.2 Low-Level Radioactive Waste Management

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,[17] and its Amendments of 1985,[18] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility, located in Andrews, Texas, is also able to accept limited volumes of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to WCNOC. The majority of the low-level radioactive waste designated for controlled disposal (Class A[19]) can be sent to Energy*Solutions*' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon WCNOC's "Long Term Waste Disposal Agreement" with Energy*Solutions*. This facility is not licensed to receive

the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste is assumed to be shipped to the WCS facility for disposal. Disposal costs are based upon preliminary and indicative information for the WCS site.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste.

The DOE issued its final Environmental Impact Statement for the disposal of GTCC on January 2016.[20] The study evaluated the potential environmental impacts associated with constructing and operating a new facility or using an existing facility, disposal methods, and locations. DOE is awaiting Congressional action on the report and its recommendations. At this time, the federal government has not identified a specific cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis only, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in canisters compatible with the spent fuel dry storage system and either stored on site or shipped directly to a federal facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste

that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates reflect the savings from waste recovery/volume reduction.

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"[21] amending 10 CFR Part 20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates assume that the Wolf Creek site will be remediated to a residual level consistent with the NRC-prescribed level.

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).[22] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.[23]

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)[24] provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other

hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

2. DECOMMISSIONING ALTERNATIVES

Detailed cost estimates were developed to decommission Wolf Creek based upon the NRC-approved decommissioning alternatives DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

Two decommissioning scenarios were evaluated for Wolf Creek. The scenarios selected are representative of alternatives available to the owner and are defined as follows:

1. The first scenario assumes that the plant would be promptly decommissioned (DECON alternative) upon the expiration of the current operating license, i.e., in 2045. All remaining spent fuel in the plant's spent fuel storage pool is transferred to the DOE or to the onsite ISFSI within the first four years. The equipment, structures, and portions of the plant containing radioactive contaminants are removed or decontaminated to a level that permits the facility to be released for unrestricted use. Site structures are then demolished. Spent fuel storage operations continue at the site until the transfer of the fuel from the ISFSI to the DOE is complete, assumed to be in the year 2078.

2. In the second scenario, the nuclear plant is placed into safe-storage (SAFSTOR alternative) at the end of its current operating license (2045). All remaining spent fuel in the plant's spent fuel storage pool is transferred to the DOE or to the onsite ISFSI and the plant reconfigured for long-term storage. Spent fuel storage operations continue at the site until the transfer of the fuel from the ISFSI to the DOE is complete, assumed to be in the year 2078. Decommissioning operations commence in 2098, with the decontamination and dismantling of Wolf Creek completed in 2105, sixty years after the cessation of operations. Site structures are then demolished, with site restoration to be complete in 2106.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facility de-activation and closure. During the first phase, notification is to be provided to the NRC

certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee is then prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Wolf Creek are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in projected expenditures.

2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility.

2.1.1 Period 1 - Preparations

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

<u>Engineering and Planning</u>

The PSDAR, required prior to or within two years of permanent cessation of operations, provides a description of the licensee's planned decommissioning activities, a timetable, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local hearing to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a

modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, work packages, and procedures, would be assembled to support the proposed decontamination and dismantling activities.

Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the

reactor vessel and its internals), internal piping, and primary shield cores.

- Isolation of the spent fuel storage pool and reactor systems, such that decommissioning operations can commence on the balance of the plant. Decommissioning operations are scheduled around the reactor areas to optimize the overall project schedule. The fuel is transferred to the DOE as allocations permit. Consequently, it is assumed that the fuel pool remains operational for approximately four years following the cessation operations.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful release of the site from the 10 CFR §50 operating license, exclusive of the ISFSI. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. For example, this will include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This will include the upgrading of roads (on- and off-site) to facilitate hauling and transport. Modifications will be required to the containment structure to facilitate access of large/heavy equipment. Modifications will also be required to the refueling area of the reactor building to support the segmentation of the reactor vessel internals and component extraction.
- Procurement and installation of all required Dry Shielded Canisters (DSCs) and horizontal storage modules (HSMs) in the ISFSI for the storage of Wolf Creek spent fuel that-cannot be transferred directly to the DOE.

- Transfer of the spent fuel from the spent fuel pool to the DOE and/or ISFSI. The spent fuel pool at Wolf Creek is kept open for approximately four years after the cessation of plant operations. In the prompt decommissioning scenario, once the majority of the decontamination and dismantling activities have been completed (over the first five years), the site organization is configured and streamlined to support the remaining spent fuel transfer activities. With the pool emptied, management resources are remobilized to support the final site survey (exclusive of the ISFSI) and building demolition.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages for the disposition of low-level radioactive waste.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from reactor vessel head. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core shroud and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments packaged in modified fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam

generator and pressurizer removal scenarios, those portions of the associated cubicles necessary for access and component extraction are removed.

- Removal of the steam generators and pressurizer for material recovery and controlled disposal. The generators will be moved to an on-site processing center, the steam domes removed and the internal components segregated for recycling. The lower shell and tube bundle will be packaged for direct disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those external areas of the package to meet transportation limits and regulations. The pressurizer is disposed of intact.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/ contaminated concrete.
- Surveys of the decontaminated areas of the containment structure.
- Removal of the contaminated equipment and material from the auxiliary and fuel buildings and any other contaminated facility. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and

components (both clean and contaminated) located within these buildings. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.

- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)."[25] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating license (that would release the property, exclusive of the ISFSI, for unrestricted use).

The NRC will amend the operating license if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the property (exclusive of the ISFSI) is suitable for release.

2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities can begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled, safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination

activities will substantially degrade power block structures including the reactor, auxiliary, fuel, and radwaste buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the plant.

It is not currently anticipated that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures, once remediation is complete, with a work force already mobilized on site is more efficient than if the process is deferred.

This cost study presumes that site structures and other facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are removed to a nominal depth of three feet below grade. The three-foot depth allows for the placement of gravel for drainage, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are restored and the plant area graded as required to prevent ponding and inhibit the refloating of subsurface materials.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material is then used on site to backfill foundation voids. Excess non-contaminated materials are trucked to an off-site area for disposal as construction debris.

2.1.4 ISFSI Operations and Decommissioning

Transfer of spent fuel to a DOE repository or interim facility is assumed to be exclusively from the ISFSI once the fuel pool has been emptied and the fuel building released for decommissioning. The ISFSI will continue to operate, for example, under a general license (10 CFR Part 50), following the amendment of the operating license to release the adjacent (power block) property.

Assuming the DOE starts accepting fuel from Wolf Creek in 2038, transfer of spent fuel from the ISFSI is anticipated to be completed by the year 2078.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the Part 50 license if it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

The design of the ISFSI is based upon a transportable storage canister to house the spent fuel assemblies, and a horizontal storage module for pad storage. It is assumed that once the canisters containing the spent fuel assemblies have been removed, any required decontamination is performed on the storage modules (some minor neutron activation is assumed), and the license for the facility terminated, the modules can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pad is then removed and the area regraded.

2.2 SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems that are not required to support the spent fuel pool or site surveillance and security are drained, de-energized, and secured (the spent fuel pool will be operational for four years after shutdown). Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although a shorter time period is expected for these activities due to the more limited work scope. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to

the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Transferring the spent fuel from the storage pool to the DOE or to the ISFSI, following the required cooling period in the spent fuel pool.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems including decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

Consistent with the DECON scenario, the spent fuel storage pool is emptied within approximately four years from the cessation of operations. The pool is drained and decontaminated and prepared for long-term storage. The transfer of the spent fuel from the ISFSI to a DOE facility begins in 2050 and continues throughout the dormancy period until completed in 2078. Once emptied, the ISFSI is placed in storage and decommissioned along with the power block structures in Period 4.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of its own actions. The security fence, sensors, alarms, and other surveillance equipment are maintained throughout the dormancy period. Fire and radiation alarms are also monitored and maintained.

After a period of storage (such that license termination is accomplished within 60 years of final shutdown), it is required that the licensee submit an application to terminate the license, along with a LTP (described in Section 2.1.2), thereby initiating the third phase.

2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning and the assembly of activity specifications and detailed work procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and this deferred scenario is the absence, in the latter, of any constraint on the dismantling process due to the operation of the spent fuel pool in the DECON option.

Radioactive decay over the length of the dormancy period will have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. However, given the levels of radioactivity and spectrum of radionuclides expected from sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. However, due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for this delayed scenario incorporates reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to ^{60}Co will substantially decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb, ^{59}Ni, and ^{63}Ni. Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the biological shield will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will

permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities begin. Dismantling, as a continuation of the decommissioning process is a cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost is consistent with that described for DECON, presuming the removal of structures and site facilities to a nominal depth of three feet below grade and the limited restoration of the site.

3. COST ESTIMATES

The cost estimates prepared for decommissioning Wolf Creek consider the unique features of the site, including the nuclear steam supply system, electric power generating systems, structures, and supporting facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

3.1 BASIS OF ESTIMATES

The current estimates were developed using the site-specific, technical information from a previous analysis performed in 2020. This information was reviewed and updated for the current analysis. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

3.2 METHODOLOGY

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"[26] and the DOE "Decommissioning Handbook."[27] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal ($/cubic yard), steel removal ($/ton), and cutting costs ($/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures rely upon information available in the industry publication, "Building Construction Cost Data," published by RSMeans. [28]

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

Regulatory Guide 1.184[29] Revision 1, issued in October 2013, describes the methods and procedures that are acceptable to the NRC staff for implementing the requirements that relate to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202,[30] issued February 2005.

This analysis reflects lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, Vermont Yankee, Fort Calhoun, Pilgrim and Indian Point nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Work Difficulty Factors

The estimates follow the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

Work difficulty adjustment factors (WDFs) account for the inefficiencies in working in a power plant environment. The factors are assigned to each unique set of unit cost factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

- Access Factor 10% to 20%
- Respiratory Protection Factor 10% to 50%
- Radiation/ALARA Factor 10% to 37%
- Protective Clothing Factor 10% to 30%
- Work Break Factor 8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiological controlled areas. The resulting labor-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities is based upon productivity information available from the "Building Construction Cost Data" publication. In the DECON alternative, dismantling of the fuel building systems and decontamination of the spent fuel pool is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pool to the DOE and/or ISFSI.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

3.3 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination, spent fuel management and site restoration.

3.3.1 Contingency

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"[31] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for a contingency percentage in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the plant.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

- Decontamination 50%
- Contaminated Component Removal 25%
- Contaminated Component Packaging 10%
- Contaminated Component Transport 15%
- Low-Level Radioactive Waste Disposal 25%

- Low-Level Radioactive Waste Processing 15%
- Reactor Segmentation 75%
- NSSS Component Removal 25%
- Reactor Waste Packaging 25%
- Reactor Waste Transport 25%

- Reactor Vessel Component Disposal 50%
- GTCC Disposal 15%

- Staffing 15%
- Spent Fuel Management 15%
- Non-Radioactive Component Removal 15%
- Heavy Equipment and Tooling 15%

- Supplies 25%
- Engineering 15%
- Energy 15%
- Insurance and Fees 10%
- Characterization and Termination Surveys 30%

- Operations and Maintenance Expense 15%
- Construction 15%
- Property Taxes 10%
- ISFSI Decommissioning 25%

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the end of each detailed estimate (as provided in Appendices C, D and F). A contingency of 25% is applied to the subtotal of the ISFSI decommissioning costs in Appendix E.

3.3.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term "financial risk." Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with eliminating 50% to 80% of the site labor force shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.

- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition, or in the timetable for such, or the start and rate of acceptance of spent fuel by the DOE.
- Pricing changes for basic inputs such as labor, energy, materials, and waste disposal. Items subject to widespread price competition (such as materials) may not show significant variation; however, others such as waste disposal could exhibit large pricing uncertainties, particularly in markets where limited access to services is available.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimates.

3.4 SITE-SPECIFIC CONSIDERATIONS

A number of site-specific considerations affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of the considerations identified below is included in this cost study.

3.4.1 Spent Fuel Management

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Wolf Creek. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, until recently, the disposal cost was being financed by a 1 mill/kWhr surcharge on nuclear generated energy delivered to customers, the fee being paid into the DOE's waste fund during operations. The D.C. Circuit

ruling on November 19, 2013, ordered the DOE to submit a proposal to Congress to suspend the Nuclear Waste Fund fee "until such time as either the Secretary chooses to comply with the Act as it is currently written, or until Congress enacts an alternative waste management plan." The fee was reduced to 0.0 mill/kWh as of May 16, 2014. The fee is expected to be reinstated in the future.

The NRC does, however, require licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below.

Completion of the decommissioning process is highly dependent upon the DOE's ability to remove spent fuel from the site. For planning purposes only, this estimate assumes that the currently shutdown sites will receive priority. WCNOC's current spent fuel management plan for the Wolf Creek spent fuel is based in general upon: 1) a 2031 start date for DOE initiating transfer of commercial spent fuel from the currently operating units to a licensed facility, and 2) expectations for spent fuel receipt by the DOE for the Wolf Creek fuel.

Assuming the DOE starts accepting fuel from the currently operating plants in 2031, and from Wolf Creek in 2038, and a maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year,[32] transfer of spent fuel from the ISFSI is anticipated to continue through the year 2078, if the plant ceases operating in 2045.

ISFSI

The new ISFSI is designed to accommodate all fuel assemblies expected to be discharged by the Wolf Creek reactor. For purposes of this analysis only, the ISFSI would be sized to accommodate 2,439 Wolf Creek assemblies.

The ISFSI will be expected to operate throughout decommissioning, and beyond the conclusion of the remediation phase in the DECON decommissioning scenario, until such time that the transfer of spent fuel to the DOE can be completed. The scenario is similar for the SAFSTOR alternative; however, based upon the expected completion date for fuel transfer, the ISFSI will be emptied prior to the commencement of decommissioning operations.

Operation and maintenance costs for the spent fuel pool and the ISFSI are included within the estimates and address the cost for staffing the facility, as well as other costs (e.g., security, insurance, and licensing fees). The estimates also include the costs to transfer the transportable storage canisters to the DOE. Costs are also provided for the final disposition of the facilities once the transfer is complete.

Storage Canister Design

A horizontal dry storage system is used as a cost basis. The system consists of a transportable storage canister with a horizontal concrete storage module. A dry-storage canister capacity of 37 pressurized water reactor assemblies was assumed.

Canister Loading and Transfer

For fuel transferred directly from the pool to the DOE, the DOE was assumed to provide Transport, Aging and Disposal (TAD) canisters with a 21 assembly capacity for pressurized water reactor fuel. The TADs are assumed to be provided at no additional cost to the owner.

The estimates include the cost for the materials and labor to load, seal and transfer each spent fuel canister from the pool into either a DOE transport cask for off-site shipment or an on-site transporter for relocation to the ISFSI.

Operations and Maintenance

The estimates also include the cost of operating and maintaining the spent fuel pool and the ISFSI, respectively. Pool operations are expected to continue for approximately four years after the cessation of operations. ISFSI operating costs are based upon the previously stated assumptions on fuel transfer expectations.

ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate to implement. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

The Wolf Creek ISFSI storage modules are assumed to have some level of neutron-induced activation as a result of the long-term storage of the Wolf Creek fuel, i.e., to levels exceeding free-release limits. As an allowance for module remediation, six horizontal modules are assumed to have some level of neutron-induced activation (i.e., to levels exceeding free-release limits), equivalent to the number of modules required to accommodate the final core off load. The ISFSI pad is not expected to be contaminated and will be demolished accordingly, after a confirmation survey.

The cost estimate for decommissioning the ISFSI reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSI is presented in Appendix E.

GTCC

The dismantling of the reactor internals is expected to generate radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. Although the DOE is responsible for disposing of GTCC waste, any costs for that service have not been determined. For purposes of this estimate, the GTCC is packaged in canisters compatible with the spent fuel dry storage system and disposed of at a cost equivalent to that envisioned for the spent fuel.

It is assumed that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is reasonable to assume that this material would remain in storage at the Wolf Creek site (for the DECON alternative). In the SAFSTOR scenario, the GTCC material is shipped directly to a DOE facility as it is generated since the fuel has been removed from the site prior to the start of delayed dismantling.

3.4.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is

performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites that have been decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel. Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when the Wolf Creek plant ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes that the reactor vessel will require segmentation, as a bounding condition.

3.4.3 Primary System Components

In the DECON scenario, the reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of dismantling operations. This type of decontamination can be expected to have a significant ALARA impact, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process liquid waste" charge. In the SAFSTOR scenario, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

The generators are disassembled on-site with the steam dome and lightly contaminated subassemblies designated for off-site recycling. The more highly contaminated tube sheet and tube bundle are packaged for direct disposal. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination.

Disposal costs are based upon the displaced volume and weight of the units. Each component is then loaded onto a rail car for transport to the disposal facility.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

3.4.4 Main Turbine and Condenser

The main turbine is dismantled using conventional maintenance procedures. The turbine rotors and shafts are removed to a laydown area. The lower turbine casings are removed from their anchors by controlled demolition. The main condensers are also disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it is surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components are packaged and readied for transport in accordance with the intended disposition.

3.4.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.[33] The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 10 CFR §173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with 10 CFR Part 71, in Type B containers. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask.

Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter.

Truck transport costs were developed from published tariffs from Tri-State Motor Transit.[34] based upon the mileage to the Energy*Solutions* facility in Clive, Utah and the Waste Control Specialist facility in Andrews County, Texas. Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. The disposal cost for the GTCC material is assumed to be inclusive of the transportation cost.

3.4.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C, D, E, and F, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

Disposal fees are based upon estimated charges, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the lowest level and majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at Energy*Solutions* facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) are based upon preliminary and indicative information on the cost for such from WCS.

Material exceeding Class C limits (limited to material closest to the reactor core and comprising less than 1% of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multi-purpose canisters used for spent fuel storage/transport.

3.4.7 Site Conditions Following Decommissioning

The NRC will amend or terminate the site license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the next step in the decommissioning process, as well as owner's own future plans for the site.

The major structures that may require decontamination or radiological remediation are the reactor, auxiliary, communication corridor, radwaste, and fuel buildings.

The estimates presented herein include the dismantling of the major structures to a nominal depth of three feet below grade, backfilling and the collapsing of below grade voids, and general terra-forming such that the site upon which the power block and supplemental structures are located is transformed into a "grassy plain."

Concrete rubble generated from demolition activities is processed and made available as clean fill for the power block foundations; excess rubble is removed from the site and disposed of as construction debris. Soil is brought in to cap the power block excavations and to permit seeding for erosion control.

A significant amount of the below grade piping is located around the perimeter of the power block. The estimate includes a cost to excavate this area to an average depth of six feet so as to expose the piping, duct bank, conduit, and any near-surface grounding grid. The overburden is surveyed and stockpiled on site for future use in backfilling the below grade voids.

The existing electrical switchyard and access roads will remain in support of the electrical transmission and distribution system. Other structures that will remain are the main dam, cooling lake, makeup water discharge structure (west side of lake), makeup water screen house (located below the John Redmond Dam) and associated underground piping, the Eisenhower Learning Center, and a railroad spur running about 11.5 miles from the plant southeast to near Aliceville, Kansas, where it connects to a Union Pacific Railroad line.

The estimates do not assume the remediation of any significant volume of contaminated soil. Costs are included, however, for the remediation of the firing range, i.e., removal of soil containing lead residue. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

3.5 ASSUMPTIONS

The following are the major assumptions made in the development of the estimates for decommissioning the site.

3.5.1 Estimating Basis

Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in 2023 dollars. Costs are not inflated, escalated, or discounted over the periods of performance.

The estimates rely upon the physical plant inventory that was the basis for the 2020 analysis (updated to reflect any material changes to the plant over the past three years).

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

3.5.2 Labor Costs

WCNOC, as the operator, will continue to provide site operations support, including decommissioning program management, licensing, radiological protection, and site security. A Decommissioning Operations Contractor (DOC) will provide the supervisory staff needed to oversee the labor subcontractors, consultants, and specialty contractors needed to perform the work required for the decontamination and dismantling effort. The DOC will also provide the engineering services needed to develop activity specifications, detailed procedures, detailed activation analyses, and support field activities such as structural modifications.

Personnel costs are based upon average salary information provided by WCNOC. Overhead costs are included for site and corporate support, reduced commensurate with the staffing of the project.

The craft labor required to decontaminate and dismantle the nuclear plant is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel (in accordance with the requirements of 10 CFR Part 37, Part 72, and Part 73).

Security levels are assumed to be maintained at “operating levels” for approximately 18 months after operations ceases. Additional reductions in force size are assumed when the spent fuel pool is empty and with the completion of the decommissioning and site restoration activities.

A profile of the staffing levels for decommissioning, including contractors and craft, is provided in Figures 3.1 and 3.2 for the DECON and SAFSTOR scenarios, respectively. Utility staffing levels will gradually

decrease after completing the removal of physical systems. Staffing levels and management support will vary based upon the amount and type of decommissioning work. Craft manpower levels decrease after systems removal and structures decontamination and drop substantially during the license termination survey period. However, craft levels increase again during the site restoration period due to the work associated with structures demolition.

3.5.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.[35] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Wolf Creek components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130[36] and NUREG/CR-0672,[37] and benchmarked to the long-lived values from NUREG/CR-3474.

Neutron activation of the containment building structure is assumed to be confined to the biological shield.

3.5.4 General

Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by WCNOC and its subcontractors. The plant's operating staff performs the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.

- Process operating waste inventories (i.e., the estimates do not address the disposition of any legacy wastes; the disposal of operating wastes during this initial period is not considered a decommissioning expense).

Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. WCNOC will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet "furnace ready" conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property is removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts are also made available for alternative use.

Energy

For estimating purposes, the plant is assumed to be de-energized, except for those facilities associated with spent fuel storage. Replacement power costs are used to calculate the cost of energy consumed during decommissioning for tooling, lighting, ventilation, and essential services.

Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums, throughout the decommissioning process, are based upon the guidance provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."[38] The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Emergency Planning

FEMA emergency planning fees are included for approximately 18 months after the cessation of plant operations. At that time, the fees are discontinued. The timing is based upon the anticipated condition of the spent fuel (i.e., the hottest spent fuel assemblies are assumed to be cool enough that no substantial Zircaloy oxidation and off-site event would occur with the loss of spent fuel pool water). State and local fees continue until all fuel has been removed from the site (approximately thirty-three years following the cessation of operations).

Severance Program

No severance program is included for the personnel in the decommissioning organization.

Taxes

Property tax payments are included for the land and those facilities that will continue to be used to support the decommissioning project. When the facilities are no longer needed, the taxes are reduced accordingly.

Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

3.6 COST ESTIMATE SUMMARY

Schedules of expenditures are provided in Tables 3.1 and 3.2. The tables delineate the costs by year of expenditure as well as cost contributor (e.g., labor, materials, and waste disposal).

The tables in Appendices C and D provide additional detail. The cost elements in these tables are assigned to one of three subcategories: "License Termination," "Spent Fuel Management," and "Site Restoration." The subcategory "License Termination" is used to accumulate costs that are consistent with "decommissioning" as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the plant's operating license, recognizing that there may be some additional cost impact from spent fuel management. These costs are identified in Tables 3.1a and 3.2a.

The "Spent Fuel Management" subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pool to the DOE, as well as the eventual transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pool and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any costs related to the final disposal of the spent fuel. These costs are identified in Tables 3.1b and 3.2b.

"Site Restoration" is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade. These costs are identified in Tables 3.1c and 3.2c.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, an

owner may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As discussed in Section 3.4.1, it is assumed that the DOE will not accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at a federal facility along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a "License Termination" expense.

Decommissioning costs are reported in 2023 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant). The schedules are based upon the detailed activity costs reported in Appendices C and D, along with the timelines presented in Section 4.

TABLE 3.1
DECON ALTERNATIVE
TOTAL ANNUAL EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	63,175	2,157	2,303	35	11,093	78,764
2046	88,822	26,148	4,211	17,166	30,963	167,311
2047	90,651	43,354	2,698	42,788	16,303	195,794
2048	100,325	60,914	2,340	36,003	14,972	214,554
2049	61,420	11,445	1,246	14,090	8,589	96,789
2050	40,995	7,249	465	22	4,625	53,356
2051	28,912	14,416	284	0	5,113	48,724
2052	9,450	2,368	36	0	3,523	15,377
2053	6,548	401	0	0	3,283	10,232
2054	6,548	401	0	0	3,283	10,232
2055	6,614	602	0	0	3,283	10,499
2056	6,565	401	0	0	3,292	10,258
2057	6,548	401	0	0	3,283	10,232
2058	6,614	602	0	0	3,283	10,499
2059	6,548	401	0	0	3,283	10,232
2060	6,565	401	0	0	3,292	10,258
2061	6,614	602	0	0	3,283	10,499
2062	6,548	401	0	0	3,283	10,232
2063	6,548	401	0	0	3,283	10,232
2064	6,632	602	0	0	3,292	10,526
2065	6,548	401	0	0	3,283	10,232
2066	6,548	401	0	0	3,283	10,232
2067	6,614	602	0	0	3,283	10,499
2068	6,565	401	0	0	3,292	10,258
2069	6,614	602	0	0	3,283	10,499
2070	6,548	401	0	0	3,283	10,232
2071	6,548	401	0	0	3,283	10,232
2072	6,632	602	0	0	3,292	10,526
2073	6,548	401	0	0	3,283	10,232
2074	6,548	401	0	0	3,283	10,232

TABLE 3.1 (continued)
DECON ALTERNATIVE
TOTAL ANNUAL EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2075	6,614	602	0	0	3,283	10,499
2076	6,565	401	0	0	3,292	10,258
2077	6,548	401	0	0	3,283	10,232
2078	6,481	1,654	0	0	19,882	28,016
2079	1,764	1,315	30	5,120	6,360	14,590
Total	656,322	182,650	13,613	115,225	203,554	1,171,363

TABLE 3.1a
DECON ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	62,624	2,157	2,303	35	8,761	75,881
2046	85,703	24,088	4,211	17,166	28,299	159,468
2047	85,558	41,172	2,698	42,788	14,104	186,320
2048	85,751	26,276	2,340	36,003	12,768	163,137
2049	55,641	11,006	1,246	14,090	7,311	89,294
2050	26,418	1,779	363	22	2,355	30,936
2051	158	0	0	0	711	868
2052	20	0	0	0	90	109
2053-77	0	0	0	0	0	0
2078	246	1,453	0	0	16,674	18,373
2079	926	300	20	5,120	5,467	11,834
Total	403,044	108,231	13,181	115,225	96,539	736,220

TABLE 3.1b
DECON ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	0	0	0	0	2,332	2,332
2046	668	2,005	0	0	2,664	5,338
2047	668	2,005	0	0	2,199	4,873
2048	11,501	34,504	0	0	2,205	48,211
2049	5,343	418	0	0	1,277	7,039
2050	6,548	401	103	0	1,636	8,687
2051	6,550	401	284	0	2,648	9,883
2052	6,632	602	36	0	3,212	10,482
2053	6,548	401	0	0	3,283	10,232
2054	6,548	401	0	0	3,283	10,232
2055	6,614	602	0	0	3,283	10,499
2056	6,565	401	0	0	3,292	10,258
2057	6,548	401	0	0	3,283	10,232
2058	6,614	602	0	0	3,283	10,499
2059	6,548	401	0	0	3,283	10,232
2060	6,565	401	0	0	3,292	10,258
2061	6,614	602	0	0	3,283	10,499
2062	6,548	401	0	0	3,283	10,232
2063	6,548	401	0	0	3,283	10,232
2064	6,632	602	0	0	3,292	10,526
2065	6,548	401	0	0	3,283	10,232
2066	6,548	401	0	0	3,283	10,232
2067	6,614	602	0	0	3,283	10,499
2068	6,565	401	0	0	3,292	10,258
2069	6,614	602	0	0	3,283	10,499
2070	6,548	401	0	0	3,283	10,232
2071	6,548	401	0	0	3,283	10,232
2072	6,632	602	0	0	3,292	10,526
2073	6,548	401	0	0	3,283	10,232
2074	6,548	401	0	0	3,283	10,232

TABLE 3.1b (continued)
DECON ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2075	6,614	602	0	0	3,283	10,499
2076	6,565	401	0	0	3,292	10,258
2077	6,548	401	0	0	3,283	10,232
2078	6,235	201	0	0	3,208	9,643
2079	0	0	0	0	0	0
Total	208,473	52,168	422	0	103,512	364,576

TABLE 3.1c
DECON ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	551	0	0	0	0	551
2046	2,450	55	0	0	0	2,505
2047	4,424	177	0	0	0	4,601
2048	3,073	134	0	0	0	3,206
2049	436	21	0	0	0	457
2050	8,030	5,068	0	0	634	13,733
2051	22,204	14,015	0	0	1,754	37,973
2052	2,798	1,766	0	0	221	4,786
2053-78	0	0	0	0	0	0
2079	838	1,015	9	0	893	2,756
Total	44,805	22,250	9	0	3,503	70,567

TABLE 3.2
SAFSTOR ALTERNATIVE
TOTAL ANNUAL EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	52,611	1,598	2,303	35	10,869	67,416
2046	55,949	9,836	2,130	1,436	28,431	97,782
2047	26,666	2,681	568	17	8,095	38,026
2048	37,570	35,182	570	17	8,117	81,455
2049	13,053	906	338	10	4,182	18,488
2050	9,997	845	284	8	3,270	14,404
2051	9,997	845	284	8	3,270	14,404
2052	10,091	1,047	285	8	3,279	14,710
2053	9,997	845	284	8	3,270	14,404
2054	9,997	845	284	8	3,270	14,404
2055	10,064	1,045	284	8	3,270	14,672
2056	10,024	846	285	8	3,279	14,442
2057	9,997	845	284	8	3,270	14,404
2058	10,064	1,045	284	8	3,270	14,672
2059	9,997	845	284	8	3,270	14,404
2060	10,024	846	285	8	3,279	14,442
2061	10,064	1,045	284	8	3,270	14,672
2062	9,997	845	284	8	3,270	14,404
2063	9,997	845	284	8	3,270	14,404
2064	10,091	1,047	285	8	3,279	14,710
2065	9,997	845	284	8	3,270	14,404
2066	9,997	845	284	8	3,270	14,404
2067	10,064	1,045	284	8	3,270	14,672
2068	10,024	846	285	8	3,279	14,442
2069	10,064	1,045	284	8	3,270	14,672
2070	9,997	845	284	8	3,270	14,404
2071	9,997	845	284	8	3,270	14,404
2072	10,091	1,047	285	8	3,279	14,710
2073	9,997	845	284	8	3,270	14,404
2074	9,997	845	284	8	3,270	14,404

TABLE 3.2 (continued)
SAFSTOR ALTERNATIVE
TOTAL ANNUAL EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2075	10,064	1,045	284	8	3,270	14,672
2076	10,024	846	285	8	3,279	14,442
2077	9,997	845	284	8	3,270	14,404
2078	9,930	644	284	8	3,270	14,137
2079	4,374	431	284	7	1,900	6,996
2080	4,386	432	285	7	1,905	7,015
2081	4,374	431	284	7	1,900	6,996
2082	4,374	431	284	7	1,900	6,996
2083	4,374	431	284	7	1,900	6,996
2084	4,386	432	285	7	1,905	7,015
2085	4,374	431	284	7	1,900	6,996
2086	4,374	431	284	7	1,900	6,996
2087	4,374	431	284	7	1,900	6,996
2088	4,386	432	285	7	1,905	7,015
2089	4,374	431	284	7	1,900	6,996
2090	4,374	431	284	7	1,900	6,996
2091	4,374	431	284	7	1,900	6,996
2092	4,386	432	285	7	1,905	7,015
2093	4,374	431	284	7	1,900	6,996
2094	4,374	431	284	7	1,900	6,996
2095	4,374	431	284	7	1,900	6,996
2096	4,386	432	285	7	1,905	7,015
2097	4,374	431	284	7	1,900	6,996
2098	8,359	816	508	16	1,958	11,657
2099	50,313	5,091	2,840	99	2,581	60,923
2100	62,997	27,807	2,756	25,512	14,985	134,058
2101	64,985	33,040	2,545	35,150	19,260	154,981
2102	55,779	9,505	2,130	12,996	7,657	88,066
2103	55,779	9,505	2,130	12,996	7,657	88,066
2104	44,587	5,588	1,220	5,431	4,398	61,225

TABLE 3.2 (continued)
SAFSTOR ALTERNATIVE
TOTAL ANNUAL EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2105	25,477	12,444	338	6	3,178	41,443
2106	15,513	9,946	192	0	2,326	27,977
Total	943,433	198,251	34,207	94,089	254,731	1,524,712

TABLE 3.2a
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	52,611	1,598	2,303	35	8,537	65,084
2046	53,277	7,830	2,130	1,436	25,767	90,441
2047	19,581	676	568	17	5,896	26,737
2048	19,635	677	570	17	5,912	26,810
2049	6,496	488	338	10	2,905	10,236
2050	3,446	444	284	8	2,208	6,389
2051	3,446	444	284	8	2,208	6,389
2052	3,455	445	285	8	2,214	6,407
2053	3,446	444	284	8	2,208	6,389
2054	3,446	444	284	8	2,208	6,389
2055	3,446	444	284	8	2,208	6,389
2056	3,455	445	285	8	2,214	6,407
2057	3,446	444	284	8	2,208	6,389
2058	3,446	444	284	8	2,208	6,389
2059	3,446	444	284	8	2,208	6,389
2060	3,455	445	285	8	2,214	6,407
2061	3,446	444	284	8	2,208	6,389
2062	3,446	444	284	8	2,208	6,389
2063	3,446	444	284	8	2,208	6,389
2064	3,455	445	285	8	2,214	6,407
2065	3,446	444	284	8	2,208	6,389
2066	3,446	444	284	8	2,208	6,389
2067	3,446	444	284	8	2,208	6,389
2068	3,455	445	285	8	2,214	6,407
2069	3,446	444	284	8	2,208	6,389
2070	3,446	444	284	8	2,208	6,389
2071	3,446	444	284	8	2,208	6,389
2072	3,455	445	285	8	2,214	6,407
2073	3,446	444	284	8	2,208	6,389
2074	3,446	444	284	8	2,208	6,389

TABLE 3.2a (continued)
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2075	3,446	444	284	8	2,208	6,389
2076	3,455	445	285	8	2,214	6,407
2077	3,446	444	284	8	2,208	6,389
2078	3,446	444	284	8	2,208	6,389
2079	4,374	431	284	7	1,900	6,996
2080	4,386	432	285	7	1,905	7,015
2081	4,374	431	284	7	1,900	6,996
2082	4,374	431	284	7	1,900	6,996
2083	4,374	431	284	7	1,900	6,996
2084	4,386	432	285	7	1,905	7,015
2085	4,374	431	284	7	1,900	6,996
2086	4,374	431	284	7	1,900	6,996
2087	4,374	431	284	7	1,900	6,996
2088	4,386	432	285	7	1,905	7,015
2089	4,374	431	284	7	1,900	6,996
2090	4,374	431	284	7	1,900	6,996
2091	4,374	431	284	7	1,900	6,996
2092	4,386	432	285	7	1,905	7,015
2093	4,374	431	284	7	1,900	6,996
2094	4,374	431	284	7	1,900	6,996
2095	4,374	431	284	7	1,900	6,996
2096	4,386	432	285	7	1,905	7,015
2097	4,374	431	284	7	1,900	6,996
2098	8,296	816	508	16	1,958	11,594
2099	49,494	5,091	2,840	99	2,581	60,104
2100	60,328	27,725	2,756	25,512	14,985	131,306
2101	62,125	32,919	2,545	35,150	19,260	152,000
2102	53,891	9,436	2,130	12,996	7,657	86,109
2103	53,891	9,436	2,130	12,996	7,657	86,109
2104	43,801	5,559	1,220	5,431	4,398	60,410

TABLE 3.2a (continued)
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2105	7,015	526	107	6	390	8,044
2106	107	0	0	0	0	107
Total	673,700	123,848	33,785	94,089	208,108	1,133,530

TABLE 3.2b
SAFSTOR ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	0	0	0	0	2,332	2,332
2046	2,672	2,005	0	0	2,664	7,342
2047	7,084	2,005	0	0	2,199	11,289
2048	17,935	34,504	0	0	2,205	54,644
2049	6,557	418	0	0	1,277	8,252
2050	6,551	401	0	0	1,062	8,015
2051	6,551	401	0	0	1,062	8,015
2052	6,636	602	0	0	1,065	8,303
2053	6,551	401	0	0	1,062	8,015
2054	6,551	401	0	0	1,062	8,015
2055	6,618	602	0	0	1,062	8,282
2056	6,569	401	0	0	1,065	8,035
2057	6,551	401	0	0	1,062	8,015
2058	6,618	602	0	0	1,062	8,282
2059	6,551	401	0	0	1,062	8,015
2060	6,569	401	0	0	1,065	8,035
2061	6,618	602	0	0	1,062	8,282
2062	6,551	401	0	0	1,062	8,015
2063	6,551	401	0	0	1,062	8,015
2064	6,636	602	0	0	1,065	8,303
2065	6,551	401	0	0	1,062	8,015
2066	6,551	401	0	0	1,062	8,015
2067	6,618	602	0	0	1,062	8,282
2068	6,569	401	0	0	1,065	8,035
2069	6,618	602	0	0	1,062	8,282
2070	6,551	401	0	0	1,062	8,015
2071	6,551	401	0	0	1,062	8,015
2072	6,636	602	0	0	1,065	8,303
2073	6,551	401	0	0	1,062	8,015
2074	6,551	401	0	0	1,062	8,015

TABLE 3.2b (continued)
SAFSTOR ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2075	6,618	602	0	0	1,062	8,282
2076	6,569	401	0	0	1,065	8,035
2077	6,551	401	0	0	1,062	8,015
2078	6,484	201	0	0	1,062	7,747
2079-2106	0	0	0	0	0	0
Total	224,894	52,168	0	0	41,509	318,571

TABLE 3.2c
SAFSTOR ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045-97	0	0	0	0	0	0
2098	63	0	0	0	0	63
2099	819	0	0	0	0	819
2100	2,669	82	0	0	0	2,752
2101	2,859	121	0	0	0	2,980
2102	1,888	69	0	0	0	1,957
2103	1,888	69	0	0	0	1,957
2104	786	29	0	0	0	815
2105	18,462	11,919	230	0	2,788	33,399
2106	15,406	9,946	192	0	2,326	27,870
Total	44,839	22,235	422	0	5,114	72,611

FIGURE 3.1
DECOMMISSIONING PERSONNEL LEVELS
DECON

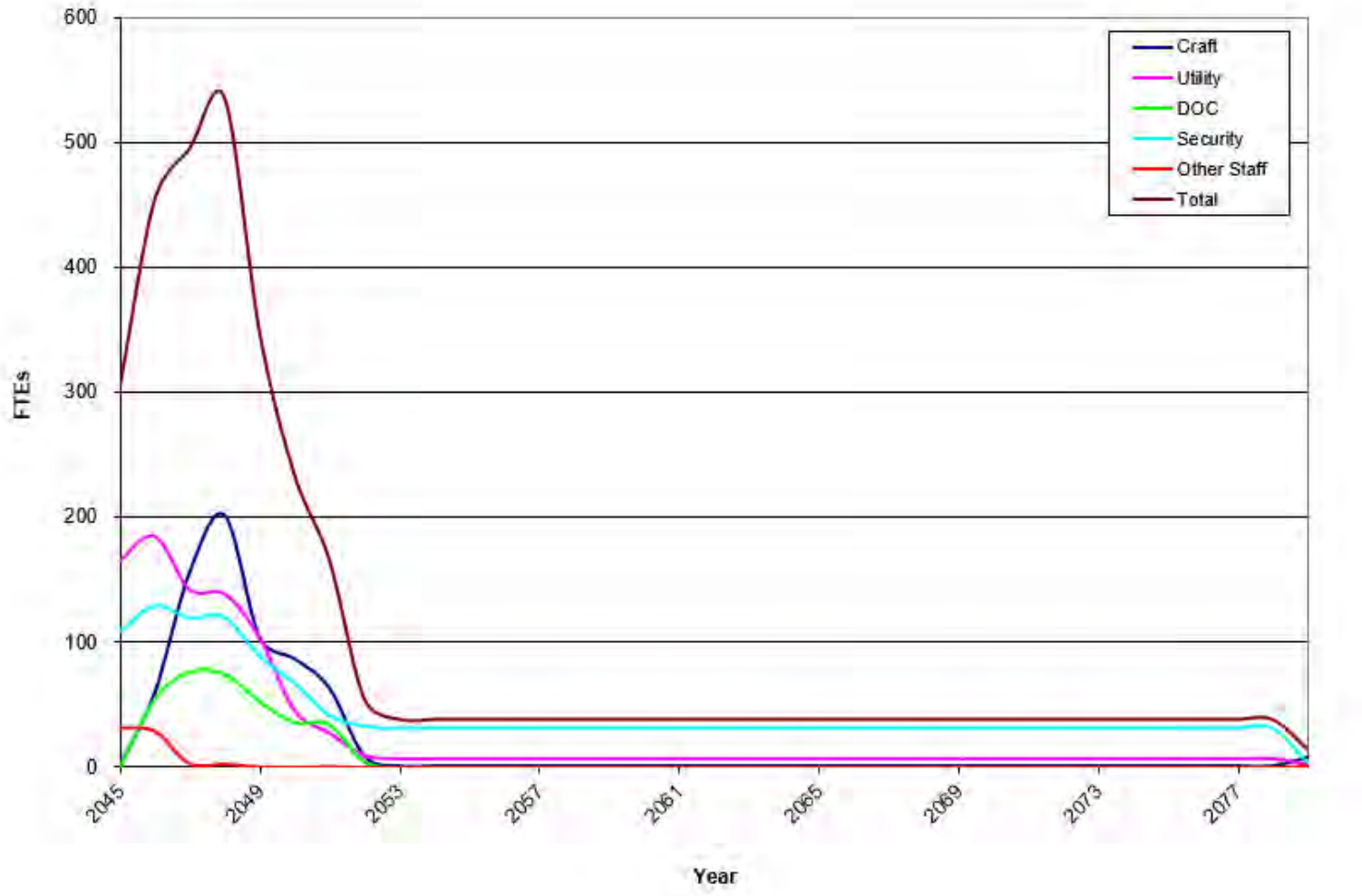
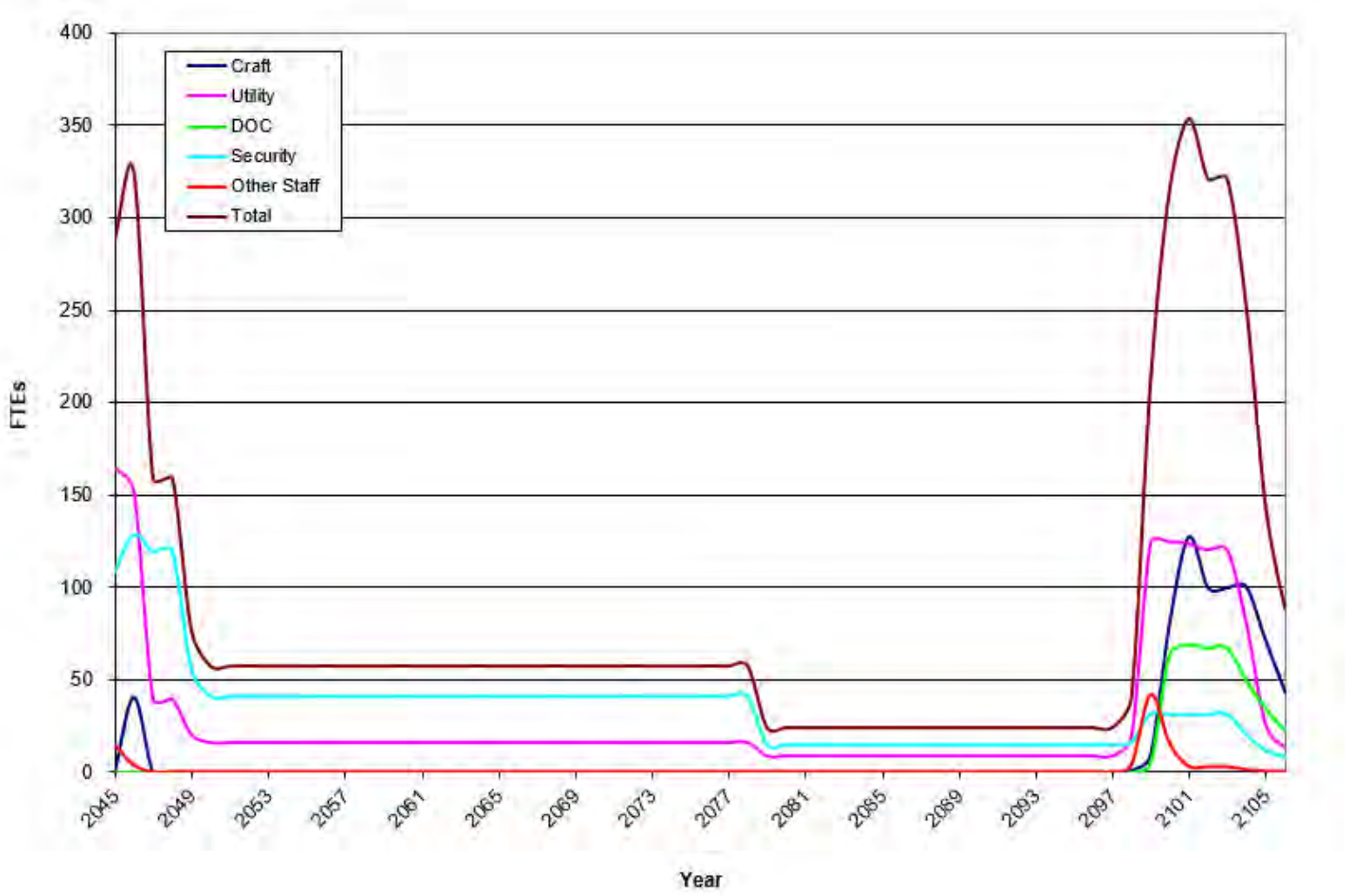


FIGURE 3.2
DECOMMISSIONING PERSONNEL LEVELS
SAFSTOR



4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this analysis follow the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management described in Section 3.4.1.

A schedule or sequence of activities for the DECON alternative is presented in Figure 4.1. The scheduling sequence is based on the fuel being removed from the spent fuel pool within approximately four years. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional" computer software. [39]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual person-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the decommissioning schedule:

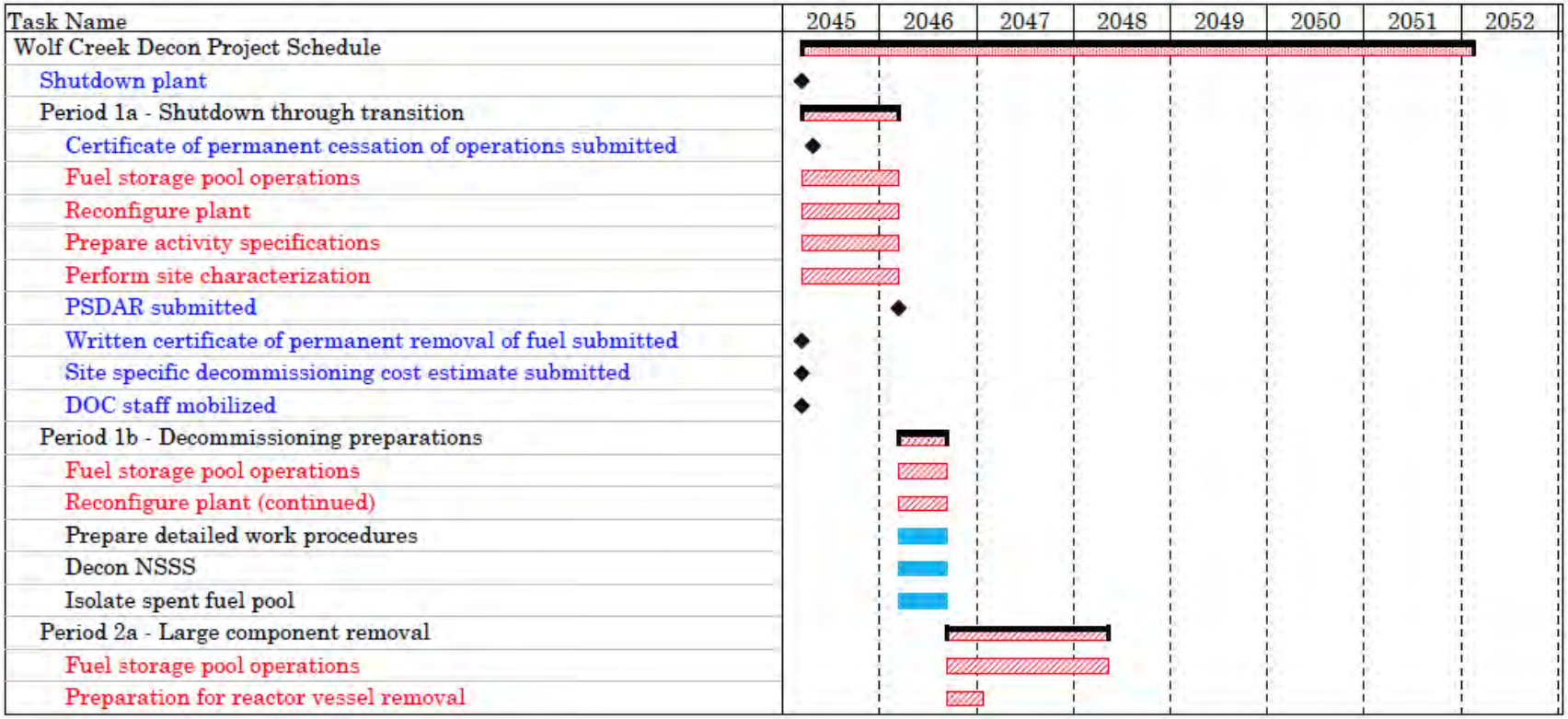
- The fuel building is isolated until such time that all spent fuel has been discharged from the spent fuel pool to the DOE and/or ISFSI. Decontamination and dismantling of the storage pool is initiated once the transfer of spent fuel is complete (DECON option).
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.
- For plant systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedules for decommissioning. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second critical path is shown for the spent fuel storage period, which determines the release of the fuel building for final decontamination.

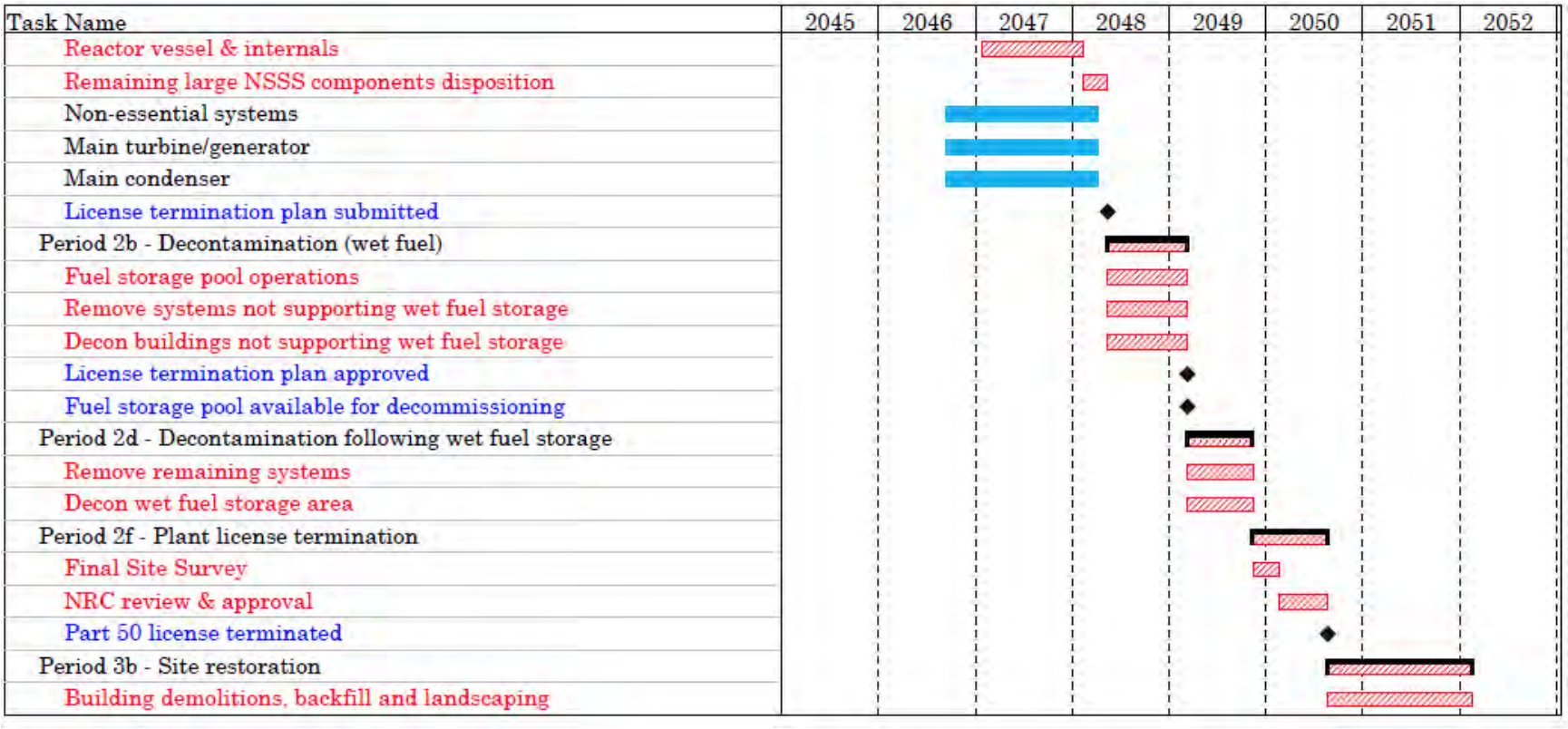
Project timelines are provided in Figures 4.2 and 4.3, with milestone dates based on the 2045 shutdown date. The fuel pool is emptied approximately four years after shutdown, while ISFSI operations continue until the DOE can complete the transfer of assemblies. Deferred decommissioning in the SAFSTOR scenario is assumed to commence so that the operating license is terminated within a 60-year period from the cessation of plant operations.

FIGURE 4.1
ACTIVITY SCHEDULE



1. Red text and/or shaded scheduling bars indicate critical path activities
2. Shaded scheduling bars associated with major decommissioning periods, e.g., Period 1a, indicate overall duration of that period
3. Blue text and/or diamond symbols indicate major milestones

FIGURE 4.1
ACTIVITY SCHEDULE
(continued)



1. Red text and/or shaded scheduling bars indicate critical path activities
2. Shaded scheduling bars associated with major decommissioning periods, e.g., Period 1a, indicate overall duration of that period
3. Blue text and/or diamond symbols indicate major milestones

FIGURE 4.2
DECOMMISSIONING TIMELINE
DECON
(not to scale)

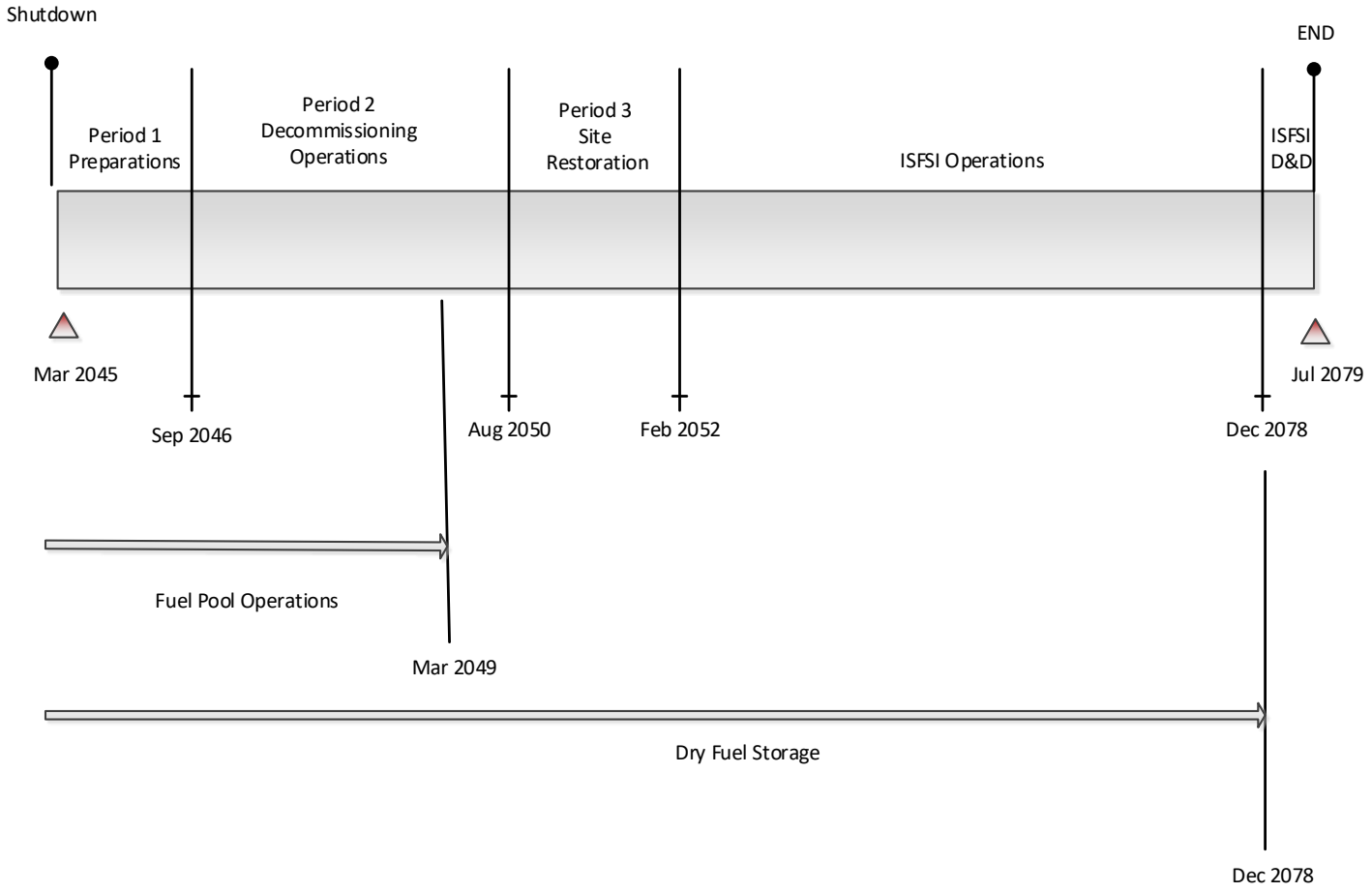
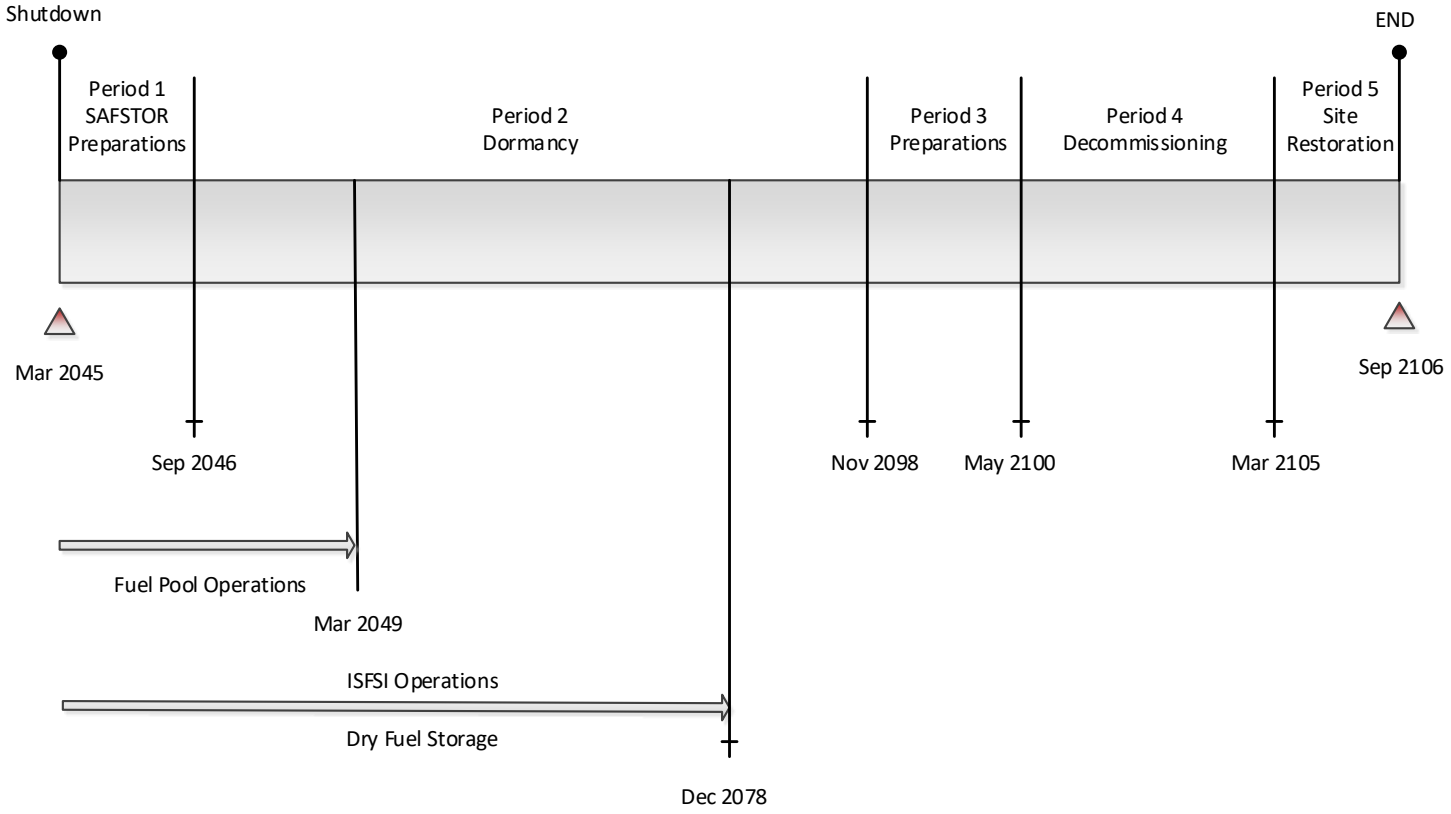


FIGURE 4.3
DECOMMISSIONING TIMELINE
SAFSTOR



5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,[40] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figures 5.1 and 5.2. The volumes are shown on a line-item basis in Appendices C and D and summarized in Tables 5.1 and 5.2. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping casks.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone (i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides). While the dose rates decrease with time, radionuclides such as ^{137}Cs will still control the disposition requirements.

The waste material produced in the decontamination and dismantling of the nuclear station is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Material that is considered potentially contaminated when removed from the radiological controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

Disposal costs for Class A waste were based upon information provided by Wolf Creek. Separate rates were used for containerized waste and large components, including the steam generators and reactor coolant pump motors. Demolition debris including miscellaneous steel, scaffolding, and concrete was disposed of at a bulk rate. The decommissioning waste stream also included resins and dry active waste.

Since Energy*Solutions* is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon preliminary and indicative rates for WCS's Andrews County disposal facility.

A small quantity of material generated during the decommissioning will not be considered suitable for near-surface disposal, and is assumed to be disposed of in a geologic repository, in a manner similar to that envisioned for spent fuel disposal. Such material, known as Greater-Than-Class-C or GTCC material, is estimated to require five spent fuel storage canisters (or the equivalent) to dispose of the most radioactive portions of the reactor vessel internals. The volume and weight reported in Tables 5.1 and 5.2 represent the packaged weight and volume of the spent fuel storage canisters.

FIGURE 5.1
RADIOACTIVE WASTE DISPOSITION

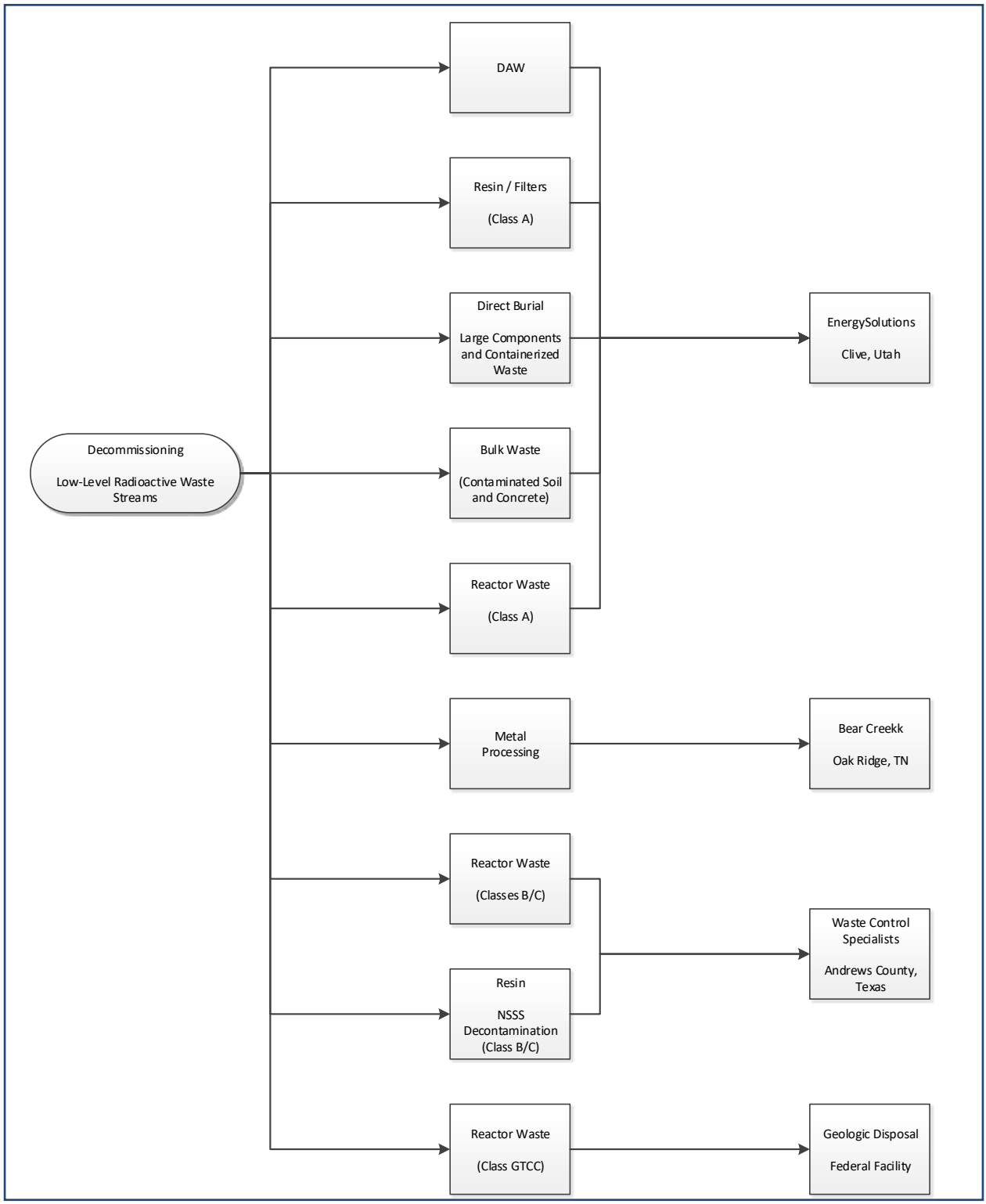


FIGURE 5.2
DECOMMISSIONING WASTE DESTINATIONS
RADIOLOGICAL

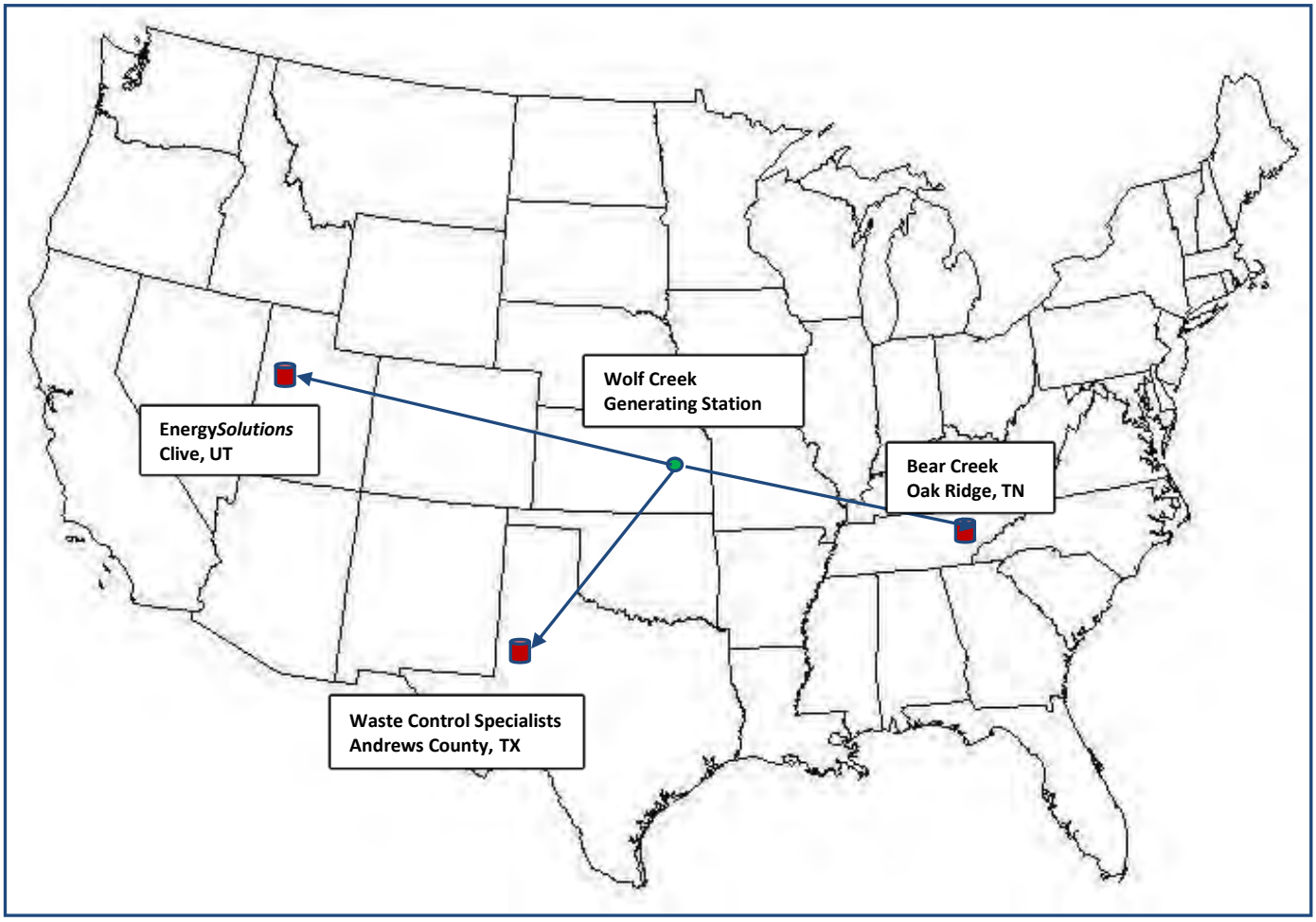


TABLE 5.1
DECON ALTERNATIVE
DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Energy*Solutions*	A	177,453	12,964,540
	WCS	B	1,750	191,469
	WCS	C	393	47,411
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	2,217	433,180
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	264,361	9,982,628
Totals [2]			446,173	23,619,229

[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

[2] Columns may not add due to rounding.

TABLE 5.2
SAFSTOR ALTERNATIVE
DECOMMISSIONING WASTE SUMMARY

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	Energy*Solutions*	A	143,761	10,493,454
	WCS	B	501	50,254
	WCS	C	406	46,747
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	2,217	433,180
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	292,159	11,146,110
Totals [2]			439,044	22,169,746

[1] Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

[2] Columns may not add due to rounding.

6. RESULTS

The analysis to estimate the costs to decommission Wolf Creek relied upon the site-specific, technical information developed for a previous analysis prepared in 2020. While not an engineering study, the estimates provide the owner with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The estimates described in this report are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the plant's spent fuel pool for a minimum of approximately four years following the cessation of operations for continued cooling of the assemblies.

The cost projected to promptly decommission (DECON) Wolf Creek is estimated to be $1,171 million. The majority of this cost (approximately 62.9%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 31.1% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 6.0% is for the demolition of the designated structures and limited restoration of the site.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be $1,525 million. The majority of this cost (approximately 74.3%) is associated with placing the plant in storage, ongoing caretaking of the plant during dormancy, and the eventual physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 20.9% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 4.8% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 and 6.2, are either labor-related or associated with the management and disposition of the radioactive waste. Program management and security are the largest single contributors to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that WCNOC will oversee the decommissioning program, using a DOC to manage the decommissioning labor force and the associated subcontractors. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating license is terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pool will remain operational for a minimum of four years following the cessation of operations. Over this period, the spent fuel will be packaged into transportable canisters for loading into a DOE-provided transport cask, or will be transferred to dry fuel storage canisters and placed on the onsite ISFSI.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the low-level radioactive material requiring controlled disposal is at the Energy*Solutions*' and WCS facilities. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing union wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license. Prompt demolition reduces future liabilities and can be more cost effective than deferral, due to the deterioration of the facilities (and therefore the working conditions) with time.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that

contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear station.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

TABLE 6.1
DECON ALTERNATIVE
DECOMMISSIONING COST ELEMENTS
(thousands of $2023)

Cost Element	Total	%
Decontamination	21,211	1.8%
Removal	151,865	13.0%
Packaging	35,868	3.1%
Transportation	20,538	1.8%
Waste Disposal	99,268	8.5%
Off-site Waste Processing	32,560	2.8%
Program Management [1]	297,023	25.4%
Site Security	238,025	20.3%
Spent Fuel Pool Isolation	16,480	1.4%
Spent Fuel Management - Direct Costs [2]	124,802	10.7%
Insurance and Regulatory Fees	35,382	3.0%
Energy	13,613	1.2%
Characterization and Licensing Surveys	21,048	1.8%
Property Taxes	51,584	4.4%
Miscellaneous Equipment	8,467	0.7%
Corporate Allocations	3,628	0.3%
Total [3]	1,171,364	100.0%

Cost Element	Total	%
License Termination	736,220	62.9%
Spent Fuel Management	364,576	31.1%
Site Restoration	70,567	6.0%
Total [3]	1,171,364	100.0%

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

TABLE 6.2
SAFSTOR ALTERNATIVE
DECOMMISSIONING COST ELEMENTS
(thousands of $2023)

Cost Element	Total	%
Decontamination	18,481	1.2%
Removal	164,663	10.8%
Packaging	22,550	1.5%
Transportation	17,141	1.1%
Waste Disposal	74,292	4.9%
Off-site Waste Processing	36,400	2.4%
Program Management [1]	461,712	30.3%
Site Security	360,895	23.7%
Spent Fuel Pool Isolation	16,480	1.1%
Spent Fuel Management - Direct Costs [2]	115,757	7.6%
Insurance and Regulatory Fees	63,335	4.2%
Energy	34,207	2.2%
Characterization and Licensing Surveys	23,470	1.5%
Property Taxes	81,735	5.4%
Miscellaneous Equipment	26,960	1.8%
Corporate Allocations	6,633	0.4%
Total [3]	1,524,712	100.0%

Cost Element	Total	%
License Termination	1,133,530	74.3%
Spent Fuel Management	318,571	20.9%
Site Restoration	72,611	4.8%
Total [3]	1,524,712	100.0%

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer/spent fuel pool O&M and EP fees
[3] Columns may not add due to rounding

7. REFERENCES

1. "Decommissioning Cost Analysis for the Wolf Creek Nuclear Plant," Document W11-1781-001, Rev. 0, TLG Services, Inc., August 2020

2. U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72, "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, 53 Fed. Reg. 24018, June 27, 1988 [Open]

3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Rev. 2, October 2011 [Open]

4. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Radiological Criteria for License Termination" [Open]

5. U.S. Code of Federal Regulations, Title 10, Parts 20 and 50, "Entombment Options for Power Reactors," Advance Notice of Proposed Rulemaking, 66 Fed. Reg. 52551, October 16, 2001 [Open]

6. U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, 61 Fed. Reg. 39278, July 29, 1996 [Open]

7. U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011 [Open]

8. "Nuclear Waste Policy Act of 1982, As Amended," 42 U.S. Code 10101, et seq. [Open]

9. Charter of the Blue Ribbon Commission on America's Nuclear Future, "Objectives and Scope of Activities" [Open]

10. "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," p. 27, 32, January 2012 [Open]

11. "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste," U.S. DOE, January 11, 2013 [Open]

12. United States Court of Appeals for the District of Columbia Circuit, In Re: Aiken County, Et Al., August 2013 [Open]

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15. U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses" [Open]

16. U.S. Code of Federal Regulations, Title 10, Part 72, Subpart K, "General License for Storage of Spent Fuel at Power Reactor Sites" [Open]

17. "Low-Level Radioactive Waste Policy Act," Public Law 96-573, 1980 [Open]

18. "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, January 15, 1986 [Open]

19. U.S. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste" [Open]

20. "Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste," (DOE/EIS-0375), January 2016 [Open]

21. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Final Rule, Radiological Criteria for License Termination," 62 Fed. Reg. 39058, July 21, 1997 [Open]

22. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," EPA Memorandum OSWER No. 9200.4-18, August 22, 1997 [Open]

23. U.S. Code of Federal Regulations, Title 40, Part 141.66, "Maximum contaminant levels for radionuclides" [Open]

24. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002 [Open]

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28. "Building Construction Cost Data 2023," RSMeans (From the Gordian Group), Rockland, Massachusetts [Open]

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30. "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005 [Open]

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39. "Microsoft Project Professional," Microsoft Corporation, Redmond, WA

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APPENDIX A

UNIT COST FACTOR DEVELOPMENT

APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	60	60
	Totals (Activity/Critical)	355	255

Duration adjustment(s):	
+ Respiratory protection adjustment (50% of critical duration)	128
+ Radiation/ALARA adjustment (37.1% of critical duration)	95
Adjusted work duration	478
+ Protective clothing adjustment (30% of adjusted duration)	143
Productive work duration	621
+ Work break adjustment (8.33 % of productive duration)	52
Total work duration (minutes)	673

*** Total duration = 11.217 hour ***

* alpha designators indicate activities that can be performed in parallel

APPENDIX A
(continued)

3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate ($/hour)	Cost
Laborers	3.00	11.217	$30.88	$1,039.14
Craftsmen	2.00	11.217	$64.96	$1,457.31
Foreman	1.00	11.217	$67.83	$760.85
General Foreman	0.25	11.217	$69.57	$195.09
Fire Watch	0.05	11.217	$30.88	$17.32
Health Physics Technician	1.00	11.217	$45.06	$505.44
Total Labor Cost				$3,975.15

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Universal Sorbent 50 @ $0.75 sq. ft. {1}	$37.50
-Tarpaulins (oil resistant/fire retardant) 50 @ $0.45/sq. ft. {2}	$22.50
-Gas torch consumables 1 @ $22.02/hr. x 1 hr. {3}	$22.02
Subtotal cost of equipment and materials	$82.02
Overhead & profit on equipment and materials @ 18.50 %	$15.17
Total costs, equipment & material	$97.19

TOTAL COST:

Removal of contaminated heat exchanger <3000 pounds:	$4,072.34
Total labor cost:	$3,975.15
Total equipment/material costs:	$97.19
Total craft labor man-hours required per unit:	81.88

5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

- References for equipment & consumables costs:

    1. www.mcmaster.com online catalog, McMaster Carr Spill Control (7193T88)
    2. R.S. Means (2023) Division 01 56, Section 13.60-0600, page 23
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- Material and consumable costs were adjusted using the regional indices for Emporia, Kansas

APPENDIX B

UNIT COST FACTOR LISTING

(DECON: Power Block Structures Only)

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean instrument and sampling tubing, $/linear foot	0.40
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	4.04
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	6.14
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	13.28
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	24.43
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	31.92
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	46.93
Removal of clean pipe >36 inches diameter, $/linear foot	55.69
Removal of clean valve >2 to 4 inches	85.52
Removal of clean valve >4 to 8 inches	132.80
Removal of clean valve >8 to 14 inches	244.28
Removal of clean valve >14 to 20 inches	319.25
Removal of clean valve >20 to 36 inches	469.29
Removal of clean valve >36 inches	556.87
Removal of clean pipe hanger for small bore piping	29.79
Removal of clean pipe hanger for large bore piping	96.22
Removal of clean pump, <300 pound	227.38
Removal of clean pump, 300-1000 pound	658.18
Removal of clean pump, 1000-10,000 pound	2,531.23
Removal of clean pump, >10,000 pound	4,906.65
Removal of clean pump motor, 300-1000 pound	273.42
Removal of clean pump motor, 1000-10,000 pound	1,049.42
Removal of clean pump motor, >10,000 pound	2,361.20
Removal of clean heat exchanger <3000 pound	1,366.40
Removal of clean heat exchanger >3000 pound	3,455.30
Removal of clean feedwater heater/deaerator	9,689.64
Removal of clean moisture separator/reheater	19,852.38
Removal of clean tank, <300 gallons	292.08
Removal of clean tank, 300-3000 gallon	914.64
Removal of clean tank, >3000 gallons, $/square foot surface area	8.12

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean electrical equipment, <300 pound	121.42
Removal of clean electrical equipment, 300-1000 pound	445.15
Removal of clean electrical equipment, 1000-10,000 pound	890.32
Removal of clean electrical equipment, >10,000 pound	2,159.84
Removal of clean electrical transformer < 30 tons	1,499.99
Removal of clean electrical transformer > 30 tons	4,319.68
Removal of clean standby diesel generator, <100 kW	1,532.10
Removal of clean standby diesel generator, 100 kW to 1 MW	3,419.75
Removal of clean standby diesel generator, >1 MW	7,079.56
Removal of clean electrical cable tray, $/linear foot	11.54
Removal of clean electrical conduit, $/linear foot	5.05
Removal of clean mechanical equipment, <300 pound	121.42
Removal of clean mechanical equipment, 300-1000 pound	445.15
Removal of clean mechanical equipment, 1000-10,000 pound	890.32
Removal of clean mechanical equipment, >10,000 pound	2,159.84
Removal of clean HVAC equipment, <300 pound	146.81
Removal of clean HVAC equipment, 300-1000 pound	534.89
Removal of clean HVAC equipment, 1000-10,000 pound	1,066.03
Removal of clean HVAC equipment, >10,000 pound	2,159.84
Removal of clean HVAC ductwork, $/pound	0.42
Removal of contaminated instrument and sampling tubing, $/linear foot	1.28
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	20.05
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	33.35
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	55.76
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	104.95
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	125.13
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	171.00
Removal of contaminated pipe >36 inches diameter, $/linear foot	201.02
Removal of contaminated valve >2 to 4 inches	404.66
Removal of contaminated valve >4 to 8 inches	494.44

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated valve >8 to 14 inches	978.35
Removal of contaminated valve >14 to 20 inches	1,237.66
Removal of contaminated valve >20 to 36 inches	1,638.91
Removal of contaminated valve >36 inches	1,939.05
Removal of contaminated pipe hanger for small bore piping	126.94
Removal of contaminated pipe hanger for large bore piping	403.86
Removal of contaminated pump, <300 pound	888.06
Removal of contaminated pump, 300-1000 pound	2,130.65
Removal of contaminated pump, 1000-10,000 pound	6,726.75
Removal of contaminated pump, >10,000 pound	16,381.27
Removal of contaminated pump motor, 300-1000 pound	933.60
Removal of contaminated pump motor, 1000-10,000 pound	2,767.00
Removal of contaminated pump motor, >10,000 pound	6,212.50
Removal of contaminated heat exchanger <3000 pound	4,072.34
Removal of contaminated heat exchanger >3000 pound	11,895.08
Removal of contaminated tank, <300 gallons	1,483.25
Removal of contaminated tank, >300 gallons, $/square foot	29.41
Removal of contaminated electrical equipment, <300 pound	670.87
Removal of contaminated electrical equipment, 300-1000 pound	1,710.72
Removal of contaminated electrical equipment, 1000-10,000 pound	3,296.01
Removal of contaminated electrical equipment, >10,000 pound	6,598.67
Removal of contaminated electrical cable tray, $/linear foot	32.49
Removal of contaminated electrical conduit, $/linear foot	16.55
Removal of contaminated mechanical equipment, <300 pound	745.91
Removal of contaminated mechanical equipment, 300-1000 pound	1,887.83
Removal of contaminated mechanical equipment, 1000-10,000 pound	3,631.23
Removal of contaminated mechanical equipment, >10,000 pound	6,598.67
Removal of contaminated HVAC equipment, <300 pound	745.91
Removal of contaminated HVAC equipment, 300-1000 pound	1,887.83
Removal of contaminated HVAC equipment, 1000-10,000 pound	3,631.23

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated HVAC equipment, >10,000 pound	6,598.67
Removal of contaminated HVAC ductwork, $/pound	2.01
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	3.68
Additional decontamination of surface by washing, $/square foot	6.95
Additional decontamination of surfaces by hydrolasing, $/square foot	38.02
Decontamination rig hook up and flush, $/ 250 foot length	6,256.58
Chemical flush of components/systems, $/gallon	30.74
Removal of clean standard reinforced concrete, $/cubic yard	73.17
Removal of grade slab concrete, $/cubic yard	83.15
Removal of clean concrete floors, $/cubic yard	381.17
Removal of sections of clean concrete floors, $/cubic yard	1,119.74
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	105.36
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	2,147.18
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	142.69
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	2,839.27
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	522.74
Removal of below-grade suspended floors, $/cubic yard	199.88
Removal of clean monolithic concrete structures, $/cubic yard	920.33
Removal of contaminated monolithic concrete structures, $/cubic yard	2,130.88
Removal of clean foundation concrete, $/cubic yard	725.56
Removal of contaminated foundation concrete, $/cubic yard	1,985.67
Explosive demolition of bulk concrete, $/cubic yard	52.42
Removal of clean hollow masonry block wall, $/cubic yard	29.62
Removal of contaminated hollow masonry block wall, $/cubic yard	75.96
Removal of clean solid masonry block wall, $/cubic yard	29.62
Removal of contaminated solid masonry block wall, $/cubic yard	75.96
Backfill of below-grade voids, $/cubic yard	37.71
Removal of subterranean tunnels/voids, $/linear foot	102.90
Placement of concrete for below-grade voids, $/cubic yard	179.18
Excavation of clean material, $/cubic yard	3.18

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Excavation of contaminated material, $/cubic yard	44.76
Removal of clean concrete rubble (tipping fee included), $/cubic yard	28.15
Removal of contaminated concrete rubble, $/cubic yard	27.76
Removal of building by volume, $/cubic foot	0.38
Removal of clean building metal siding, $/square foot	1.17
Removal of contaminated building metal siding, $/square foot	3.94
Removal of standard asphalt roofing, $/square foot	1.88
Removal of transite panels, $/square foot	2.19
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	12.84
Scabbling contaminated concrete floors, $/square foot	7.29
Scabbling contaminated concrete walls, $/square foot	18.83
Scabbling contaminated ceilings, $/square foot	64.24
Scabbling structural steel, $/square foot	6.24
Removal of clean overhead crane/monorail < 10 ton capacity	661.08
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,813.84
Removal of clean overhead crane/monorail >10-50 ton capacity	1,586.61
Removal of contaminated overhead crane/monorail >10-50 ton capacity	4,352.47
Removal of polar crane > 50 ton capacity	6,716.42
Removal of gantry crane > 50 ton capacity	24,118.21
Removal of structural steel, $/pound	0.28
Removal of clean steel floor grating, $/square foot	5.33
Removal of contaminated steel floor grating, $/square foot	14.85
Removal of clean free standing steel liner, $/square foot	12.18
Removal of contaminated free standing steel liner, $/square foot	34.24
Removal of clean concrete-anchored steel liner, $/square foot	6.09
Removal of contaminated concrete-anchored steel liner, $/square foot	39.94
Placement of scaffolding in clean areas, $/square foot	15.46
Placement of scaffolding in contaminated areas, $/square foot	23.86
Landscaping with topsoil, $/acre	27,304.51
Cost of CPC B-88 LSA box & preparation for use	2,170.11

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Cost of CPC B-25 LSA box & preparation for use	1,855.07
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,676.95
Cost of CPC B-144 LSA box & preparation for use	10,892.01
Cost of LSA drum & preparation for use	368.24
Cost of cask liner for CNSI 8 120A cask (resins)	14,805.10
Cost of cask liner for CNSI 8 120A cask (filters)	10,501.16
Decontamination of surfaces with vacuuming, $/square foot	0.82

APPENDIX C

DETAILED COST ANALYSIS

DECON

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	262	39	301	301	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	601	90	692	692	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	981	147	1,128	1,128	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	405	61	466	466	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	981	147	1,128	1,128	-	-	-	-	-	-	-	-	-	7,500
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	654	98	752	752	-	-	-	-	-	-	-	-	-	5,000
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	643	97	740	666	-	74	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	545	82	627	564	-	63	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	928	139	1,068	1,068	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	850	127	977	977	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	209	31	241	120	-	120	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	408	61	469	235	-	235	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	601	90	692	692	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	118	18	135	68	-	68	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,946	742	5,688	5,009	-	679	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	314	47	361	361	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	4,000	600	4,600	4,600	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	17,020	2,553	19,573	18,893	-	679	-	-	-	-	-	-	-	78,157
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	440	66	505	-	505	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	440	66	505	-	505	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	3,210	321	3,531	3,531	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	3,691	369	4,060	4,060	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	888	-	-	-	-	-	222	1,110	1,110	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	657	-	-	-	-	-	99	755	755	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	10	-	35	-	11	69	69	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,469	370	2,840	2,840	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,252	125	1,377	1,377	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,448	145	1,593	-	1,593	-	-	-	-	-	-	-	-	-
1a.4.9	INPO Fees	-	-	-	-	-	-	358	54	411	411	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	988	148	1,136	-	1,136	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	127	19	146	-	146	-	-	-	-	-	-	-	-	-
1a.4.12	Corporate A&G Cost	-	-	-	-	-	-	651	98	749	749	-	-	-	-	-	-	-	-	-	-
1a.4.13	NEI Annual Fees	-	-	-	-	-	-	577	87	664	664	-	-	-	-	-	-	-	-	-	-
1a.4.14	Security Staff Cost	-	-	-	-	-	-	17,743	2,661	20,404	20,404	-	-	-	-	-	-	-	-	-	277,740
1a.4.15	Utility Staff Cost	-	-	-	-	-	-	33,657	5,049	38,706	38,706	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,545	13	10	-	35	66,172	9,778	77,551	74,676	2,875	-	-	610	-	-	-	12,190	20	699,980
1a.0	TOTAL PERIOD 1a COST	-	1,545	13	10	-	35	83,631	12,397	97,629	93,569	3,381	679	-	610	-	-	-	12,190	20	778,137

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	619	93	712	641	-	71	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	327	49	376	376	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	177	26	203	51	-	152	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	475	71	546	546	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	157	24	180	90	-	90	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	157	24	180	180	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	601	90	692	692	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	131	20	150	75	-	75	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	204	31	235	-	-	235	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	204	31	235	-	-	235	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	357	54	411	369	-	41	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	357	54	411	369	-	41	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	4,347	652	4,999	4,059	-	940	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	990	-	-	-	-	-	-	495	1,485	1,485	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	990	-	-	-	-	-	4,347	1,147	6,484	5,544	-	940	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	14,330	2,150	16,480	16,480	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	3,128	938	4,066	4,066	-	-	-	-	-	-	-	-	19,100	7,852
1b.2.3	Misc/Hazardous Waste	-	-	139	58	58	-	-	31	288	288	-	-	11,790	-	-	-	-	137,800	740	-
1b.2	Subtotal Period 1b Additional Costs	-	-	139	58	58	-	17,458	3,119	20,834	20,834	-	-	11,790	-	-	-	-	137,800	19,840	7,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	1,193	-	-	-	-	-	-	179	1,371	1,371	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,398	210	1,608	1,608	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	49	-	35	59	-	135	-	71	349	349	-	-	-	283	-	-	-	16,999	55	-
1b.3.4	Process decommissioning chemical flush waste	2	-	93	289	-	2,825	-	760	3,970	3,970	-	-	-	-	788	-	-	83,917	147	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,400	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	2,489	-	-	-	-	-	-	373	2,862	2,862	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,159	174	1,333	-	1,333	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	3,733	1,402	128	348	-	2,961	2,557	1,977	13,106	11,773	1,333	-	-	283	788	-	-	100,916	203	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	43	-	-	-	-	-	-	11	54	54	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	1,600	160	1,760	1,760	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,841	184	2,025	2,025	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	503	-	-	-	-	-	126	629	629	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	328	-	-	-	-	-	49	377	377	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	6	-	20	-	7	40	40	-	-	-	356	-	-	-	7,122	12	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	2,463	369	2,832	2,832	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	370	37	407	407	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	722	72	794	-	794	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	493	74	567	-	567	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	63	9	73	-	73	-	-	-	-	-	-	-	-	-
1b.4.12	Corporate A&G Cost	-	-	-	-	-	-	326	49	375	375	-	-	-	-	-	-	-	-	-	-
1b.4.13	NEI Annual Fees	-	-	-	-	-	-	288	43	331	331	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	8,746	1,312	10,058	10,058	-	-	-	-	-	-	-	-	-	136,904
1b.4.15	DOC Staff Cost	-	-	-	-	-	-	6,215	932	7,147	7,147	-	-	-	-	-	-	-	-	-	63,266
1b.4.16	Utility Staff Cost	-	-	-	-	-	-	16,871	2,531	19,402	19,402	-	-	-	-	-	-	-	-	-	211,579
1b.4	Subtotal Period 1b Period-Dependent Costs	43	830	7	6	-	20	39,997	5,965	46,870	45,436	1,434	-	-	356	-	-	-	7,122	12	411,749
1b.0	TOTAL PERIOD 1b COST	4,766	2,233	275	412	58	2,981	64,360	12,209	87,293	83,586	2,767	940	11,790	639	788	-	-	245,838	21,120	452,844
PERIOD 1 TOTALS		4,766	3,777	287	422	58	3,016	147,991	24,605	184,923	177,155	6,148	1,620	11,790	1,249	788	-	-	258,028	21,140	1,230,980

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	201	185	40	122	-	735	-	353	1,635	1,635	-	-	-	2,046	-	-	-	142,726	6,863	-
2a.1.1.2	Pressurizer Relief Tank	34	26	11	34	-	208	-	82	395	395	-	-	-	578	-	-	-	40,338	1,077	-
2a.1.1.3	Reactor Coolant Pumps & Motors	102	95	175	266	-	1,584	-	528	2,752	2,752	-	-	-	4,664	-	-	-	816,140	4,188	100
2a.1.1.4	Pressurizer	-	65	798	187	-	1,270	-	442	2,761	2,761	-	-	-	3,739	-	-	-	293,734	1,666	1,875
2a.1.1.5	Steam Generators	-	8,153	5,479	4,207	3,622	7,885	-	5,732	35,078	35,078	-	-	40,845	23,217	-	-	-	3,619,368	23,331	5,750
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	170	294	256	134	-	865	-	421	2,140	2,140	-	-	-	4,534	-	-	-	168,041	8,136	-
2a.1.1.7	Reactor Vessel Internals	73	7,546	15,283	1,391	-	15,682	371	17,761	58,108	58,108	-	-	-	4,194	963	393	-	340,568	31,273	1,409
2a.1.1.8	Reactor Vessel	116	9,402	3,013	1,730	-	4,837	371	10,770	30,240	30,240	-	-	-	13,620	-	-	-	972,936	31,273	1,409
2a.1.1	Totals	696	25,767	25,055	8,072	3,622	33,067	743	36,088	133,108	133,108	-	-	40,845	56,591	963	393	-	6,393,852	107,807	10,544
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	521	397	154	834	834	-	526	3,266	3,266	-	-	4,844	2,698	-	-	-	462,027	9,734	-
2a.1.3	Main Condensers	-	1,456	229	233	995	1,052	-	834	4,798	4,798	-	-	7,701	3,216	-	-	-	550,847	27,762	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	549	-	-	-	-	-	82	631	631	-	-	-	-	-	-	-	-	4,871	-
2a.1.4.2	Auxiliary	-	299	-	-	-	-	-	45	344	344	-	-	-	-	-	-	-	-	2,194	-
2a.1.4.3	Hot Machine Shop	-	1	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	7	-
2a.1.4.4	Radwaste	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	387	-
2a.1.4.5	Fuel Building	-	118	-	-	-	-	-	18	135	135	-	-	-	-	-	-	-	-	773	-
2a.1.4	Totals	-	1,023	-	-	-	-	-	153	1,176	1,176	-	-	-	-	-	-	-	-	8,233	-
Disposal of Plant Systems																					
2a.1.5.1	AB - Main Steam	-	254	-	-	-	-	-	38	292	-	-	292	-	-	-	-	-	-	5,833	-
2a.1.5.2	AB - Main Steam RCA	-	78	4	32	251	-	-	63	428	428	-	-	2,156	-	-	-	-	87,550	1,515	-
2a.1.5.3	AC - Main Turbine	-	254	-	-	-	-	-	38	292	-	-	292	-	-	-	-	-	-	5,641	-
2a.1.5.4	AD - Condensate	-	287	-	-	-	-	-	43	330	-	-	330	-	-	-	-	-	-	6,144	-
2a.1.5.5	AE - Feedwater	-	195	-	-	-	-	-	29	224	-	-	224	-	-	-	-	-	-	4,271	-
2a.1.5.6	AF - Feedwater Hter Extrction, Drn & Vnt	-	235	-	-	-	-	-	35	270	-	-	270	-	-	-	-	-	-	5,352	-
2a.1.5.7	AK - Condensate Demineralizer	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,944	-
2a.1.5.8	AL - Auxiliary Feedwater	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	1,174	-
2a.1.5.9	AL-Auxiliary Feedwater Surge Tanks	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	72	-
2a.1.5.10	AN - Demineralized Wtr Storage & xfer	-	67	-	-	-	-	-	10	78	-	-	78	-	-	-	-	-	-	1,548	-
2a.1.5.11	AP - Condensate Storage & Transfer	-	85	-	-	-	-	-	13	98	-	-	98	-	-	-	-	-	-	1,660	-
2a.1.5.12	AQ - Condensate & Feedwater Chem Additn	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	468	-
2a.1.5.13	AX - Acid Feed	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	754	-
2a.1.5.14	Auxiliary Bldg Non-System Specific	-	115	6	16	55	92	-	63	349	349	-	-	474	282	-	-	-	37,164	2,282	-
2a.1.5.15	Auxiliary Bldg Non-System Specific RCA	-	713	15	113	889	-	-	330	2,060	2,060	-	-	7,629	-	-	-	-	309,812	13,471	-
2a.1.5.16	BL - Reactor Makeup Water	-	298	25	57	225	281	-	189	1,074	1,074	-	-	1,928	850	-	-	-	132,796	5,872	-
2a.1.5.17	BM - Steam Generator Blowdown	-	600	10	76	601	-	-	253	1,540	1,540	-	-	5,160	-	-	-	-	209,560	11,982	-
2a.1.5.18	CA - Steam Seal	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	455	-
2a.1.5.19	CB - Main Turbine Lube Oil	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	1,207	-
2a.1.5.20	CC - Generator Hydrogen & CO2	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	198	-
2a.1.5.21	CD - Generator Seal Oil	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	287	-
2a.1.5.22	CE - Stator Cooling Water	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	241	-
2a.1.5.23	CF - Lube Oil Strg, Xfer & Purification	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	812	-
2a.1.5.24	CG - Condenser Air Removal	-	30	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	657	-
2a.1.5.25	CH - Main Turbine Control Oil	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,219	-
2a.1.5.26	CL - Chlorination	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	569	-
2a.1.5.27	CO - Carbon Dioxide	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	121	-
2a.1.5.28	CW - Circulating Water	-	347	-	-	-	-	-	52	399	-	-	399	-	-	-	-	-	-	7,858	-
2a.1.5.29	CZ - Caustic Acid	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	111	-
2a.1.5.30	Control Bldg Non-System Specific	-	184	4	32	249	-	-	89	557	557	-	-	2,139	-	-	-	-	86,849	3,413	-
2a.1.5.31	Control Bldg Non-System Specific Cln	-	1,380	-	-	-	-	-	207	1,587	-	-	1,587	-	-	-	-	-	-	29,076	-
2a.1.5.32	DA - Circulating Water System	-	351	-	-	-	-	-	53	404	-	-	404	-	-	-	-	-	-	7,953	-
2a.1.5.33	DM - Equipment Drains	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,223	-
2a.1.5.34	DM - Equipment Drains RCA	-	148	31	229	1,800	-	-	344	2,552	2,552	-	-	15,445	-	-	-	-	627,223	2,840	-
2a.1.5.35	EB - Closed Cooling Water	-	55	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	1,267	-
2a.1.5.36	EG - Component Cooling Water RCA	-	722	29	210	1,650	-	-	462	3,073	3,073	-	-	14,161	-	-	-	-	575,071	13,646	-
2a.1.5.37	EJ - Residual Heat Removal	-	386	57	121	318	792	-	366	2,040	2,040	-	-	2,727	2,411	-	-	-	264,564	7,897	-
2a.1.5.38	EM - High Pressure Coolant Injection	-	310	19	40	147	215	-	161	891	891	-	-	1,260	648	-	-	-	92,828	6,201	-
2a.1.5.39	EN - Containment Spray	-	219	6	45	353	-	-	115	738	738	-	-	3,026	-	-	-	-	122,874	4,134	-
2a.1.5.40	EP - Accumulator Safety Injection	-	165	11	33	183	94	-	98	583	583	-	-	1,568	283	-	-	-	81,940	3,246	-
2a.1.5.41	FA - Auxiliary Steam Generator	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	521	-

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
DIsposal of Plant Systems (continued)																					
2a.1.5.42	FB - Auxiliary Steam	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	2,106	-
2a.1.5.43	FB - Auxiliary Steam RCA	-	83	2	12	95	-	-	37	229	229	-	-	816	-	-	-	-	33,148	1,537	-
2a.1.5.44	FC - Auxiliary Turbines	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	1,301	-
2a.1.5.45	FE - Auxiliary Steam Chemical Addition	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	105	-
2a.1.5.46	FP - Fire Protection	-	171	-	-	-	-	-	26	196	-	-	196	-	-	-	-	-	-	3,826	-
2a.1.5.47	GA - Plant Heating	-	82	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	1,912	-
2a.1.5.48	GB - Central Chilled Water	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,803	-
2a.1.5.49	GE - Turbine Bldg HVAC	-	137	-	-	-	-	-	21	157	-	-	157	-	-	-	-	-	-	3,189	-
2a.1.5.50	GF - Miscellaneous Building HVAC	-	41	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	987	-
2a.1.5.51	GL - Auxiliary Building HVAC	-	464	15	83	590	75	-	237	1,464	1,464	-	-	5,064	228	-	-	-	220,197	8,491	-
2a.1.5.52	GS - Containment Hydrogen Control	-	76	5	13	77	35	-	42	247	247	-	-	658	104	-	-	-	33,502	1,559	-
2a.1.5.53	HE - Boron Recycle	435	506	40	86	303	466	-	523	2,359	2,359	-	-	2,600	1,411	-	-	-	196,130	16,660	-
2a.1.5.54	HF - Secondary Liquid Waste	810	997	88	199	721	1,057	-	1,065	4,938	4,938	-	-	6,186	3,203	-	-	-	456,359	31,896	-
2a.1.5.55	HY - Hydrogen	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	223	-
2a.1.5.56	KC - Fire Protection	-	410	-	-	-	-	-	61	471	-	-	471	-	-	-	-	-	-	9,256	-
2a.1.5.57	KH - Service Gas	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	644	-
2a.1.5.58	LA - Sanitary Drains	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	290	-
2a.1.5.59	LE - Oily Waste	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	2,575	-
2a.1.5.60	LE - Oily Waste RCA	-	194	3	25	200	-	-	83	506	506	-	-	1,718	-	-	-	-	69,785	3,518	-
2a.1.5.61	NT - Nitrogen	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	149	-
2a.1.5.62	OX - Oxygen	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	171	-
2a.1.5.63	RM - Process Sampling & Analysis	-	137	9	18	77	81	-	70	392	392	-	-	661	240	-	-	-	42,525	2,774	-
2a.1.5.64	Radwaste Bldg Non-System Specific	-	186	11	27	82	162	-	105	574	574	-	-	705	497	-	-	-	60,190	3,653	-
2a.1.5.65	SJ - Nuclear Sampling	-	80	6	13	49	62	-	45	255	255	-	-	423	184	-	-	-	29,191	1,620	-
2a.1.5.66	SW - Screen Wash	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	635	-
2a.1.5.67	SZ - Service Air	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	1,892	-
2a.1.5.68	Turbine Bldg Non-System Specific	-	749	-	-	-	-	-	112	862	-	-	862	-	-	-	-	-	-	15,405	-
2a.1.5.69	VA - I&C Shop HVAC	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	155	-
2a.1.5.70	VB - I&C Shop Computer Room HVAC	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	106	-
2a.1.5.71	VH - Circ Water & Makeup Water Scrnhs	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	272	-
2a.1.5.72	VJ - Shop Bldg Machine Shop Area Vent	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	57	-
2a.1.5.73	VL - Shop Building HVAC	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	101	-
2a.1.5.74	VV - Misc Bldg HVAC	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	148	-
2a.1.5.75	WG - Gland Water & Motor Cooling Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	593	-
2a.1.5.76	WL - Cooling Lake Makeup & Blowdown	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	745	-
2a.1.5.77	WM - Makeup Demineralizer	-	177	-	-	-	-	-	27	203	-	-	203	-	-	-	-	-	-	3,929	-
2a.1.5.78	WS - Plant Services Water	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	3,297	-
2a.1.5.79	Yard Non-System Specific	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	603	-
2a.1.5	Totals	1,246	13,304	397	1,479	8,917	3,411	-	5,736	34,490	26,852	-	7,639	76,504	10,341	-	-	-	3,769,256	293,319	-
2a.1.6	Scaffolding in support of decommissioning	-	1,423	27	23	156	35	-	394	2,058	2,058	-	-	1,206	106	-	-	-	61,032	36,964	-
2a.1	Subtotal Period 2a Activity Costs	1,942	43,492	26,105	9,961	14,523	38,399	743	43,732	178,896	171,257	-	7,639	131,100	72,952	963	393	-	11,237,010	483,818	10,544
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,565	470	2,035	2,035	-	-	-	-	-	-	-	-	34,738	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	1,565	470	2,035	2,035	-	-	-	-	-	-	-	-	34,738	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	220	-	158	265	-	612	-	318	1,573	1,573	-	-	-	1,280	-	-	-	76,774	249	-
2a.3.2	Process decommissioning chemical flush waste	1	-	49	150	-	348	-	115	664	664	-	-	-	410	-	-	-	43,711	77	-
2a.3.3	Small tool allowance	-	435	-	-	-	-	-	65	500	450	-	50	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	17,370	2,605	19,975	-	19,975	-	-	-	-	-	-	-	-	-
2a.3.5	On-site survey and release of 120.7 tons clean metallic waste	-	-	-	-	-	-	174	17	191	191	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	221	435	206	415	-	960	17,544	3,122	22,904	2,878	19,975	50	-	1,690	-	-	-	120,485	326	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	145	-	-	-	-	-	-	36	181	181	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,042	104	1,146	1,146	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	6,169	617	6,786	6,786	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	5,786	-	-	-	-	-	1,446	7,232	7,232	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,714	-	-	-	-	-	557	4,271	4,271	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	138	108	-	384	-	126	756	756	-	-	-	6,685	-	-	-	133,707	218	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	3,921	588	4,509	4,509	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	1,124	112	1,236	1,236	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,393	139	1,532	-	1,532	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,652	248	1,899	-	1,899	-	-	-	-	-	-	-	-	-
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	211	32	243	-	243	-	-	-	-	-	-	-	-	-

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs (continued)																					
2a.4.12	Corporate A&G Cost	-	-	-	-	-	-	759	114	873	873	-	-	-	-	-	-	-	-	-	-
2a.4.13	NEI Annual Fees	-	-	-	-	-	-	965	145	1,109	1,109	-	-	-	-	-	-	-	-	-	-
2a.4.14	Security Staff Cost	-	-	-	-	-	-	26,817	4,023	30,840	30,840	-	-	-	-	-	-	-	-	-	413,664
2a.4.15	DOC Staff Cost	-	-	-	-	-	-	25,394	3,809	29,203	29,203	-	-	-	-	-	-	-	-	-	264,189
2a.4.16	Utility Staff Cost	-	-	-	-	-	-	40,934	6,140	47,074	47,074	-	-	-	-	-	-	-	-	-	491,877
2a.4	Subtotal Period 2a Period-Dependent Costs	145	9,500	138	108	-	384	110,379	18,236	138,889	135,214	3,675	-	-	6,685	-	-	-	133,707	218	1,169,729
2a.0	TOTAL PERIOD 2a COST	2,307	53,427	26,449	10,485	14,523	39,743	130,231	65,559	342,724	311,385	23,650	7,689	131,100	81,327	963	393	-	11,491,200	519,100	1,180,273
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	AN - Demineralized Wtr Strg & xfer RCA	-	19	0	2	14	-	-	7	42	42	-	-	120	-	-	-	-	4,855	334	-
2b.1.1.2	BB - Reactor Coolant	-	309	38	81	204	547	-	261	1,440	1,440	-	-	1,746	1,669	-	-	-	177,118	6,412	-
2b.1.1.3	BG - Chemical & Volume Control	1,038	946	121	237	571	1,622	-	1,294	5,830	5,830	-	-	4,899	4,925	-	-	-	513,906	27,846	-
2b.1.1.4	BN - Borated Refueling Water Storage	-	348	22	99	642	175	-	244	1,531	1,531	-	-	5,512	533	-	-	-	257,802	6,939	-
2b.1.1.5	DO - Diesel Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	48	-
2b.1.1.6	EA - Service Water	-	116	-	-	-	-	-	17	133	-	-	133	-	-	-	-	-	-	2,592	-
2b.1.1.7	EF - Essential Service Water	-	166	-	-	-	-	-	25	191	-	-	191	-	-	-	-	-	-	3,800	-
2b.1.1.8	EF - Essential Service Water RCA	-	90	3	21	166	-	-	51	331	331	-	-	1,427	-	-	-	-	57,959	1,734	-
2b.1.1.9	FO - Fuel Oil	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	486	-
2b.1.1.10	FP - Fire Protection RCA	-	198	9	67	524	-	-	139	936	936	-	-	4,492	-	-	-	-	182,411	3,541	-
2b.1.1.11	GA - Plant Heating RCA	-	114	2	11	87	-	-	43	257	257	-	-	746	-	-	-	-	30,275	2,072	-
2b.1.1.12	GB - Central Chilled Water RCA	-	26	0	3	22	-	-	10	62	62	-	-	187	-	-	-	-	7,591	482	-
2b.1.1.13	GD - Esstl Srvc Wtr Pumphs Bldg HVAC	-	13	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	284	-
2b.1.1.14	GH - Radwaste Building HVAC	-	187	7	39	283	32	-	104	652	652	-	-	2,425	98	-	-	-	104,702	3,455	-
2b.1.1.15	GK - Control Building HVAC	-	156	-	-	-	-	-	23	179	-	-	179	-	-	-	-	-	-	3,959	-
2b.1.1.16	GM - Diesel Generator Building HVAC	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	695	-
2b.1.1.17	GN - Containment Cooling	-	508	28	130	857	211	-	331	2,065	2,065	-	-	7,354	643	-	-	-	339,572	9,502	-
2b.1.1.18	GP - Containmnt Integratd Leak Rate Test	-	40	1	9	68	-	-	22	139	139	-	-	580	-	-	-	-	23,570	750	-
2b.1.1.19	GR - Containment Atmospheric Control	-	20	3	17	127	13	-	30	211	211	-	-	1,086	41	-	-	-	46,686	392	-
2b.1.1.20	GT - Contaiment Purge HVAC	-	120	7	35	227	56	-	84	528	528	-	-	1,948	170	-	-	-	89,946	2,259	-
2b.1.1.21	HA - Gaseous Radwaste	-	364	25	64	324	223	-	207	1,207	1,207	-	-	2,782	666	-	-	-	156,216	7,037	-
2b.1.1.22	HB - Liquid Radwaste	863	877	81	174	646	908	-	1,009	4,558	4,558	-	-	5,544	2,742	-	-	-	401,460	30,762	-
2b.1.1.23	HC - Solid Radwaste	-	485	53	111	324	684	-	363	2,020	2,020	-	-	2,781	2,076	-	-	-	245,800	9,589	-
2b.1.1.24	HD - Decontamination	-	106	6	20	115	57	-	62	366	366	-	-	983	171	-	-	-	50,973	2,051	-
2b.1.1.25	JE - Emergency Fuel Oil	-	63	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,260	-
2b.1.1.26	KA - Compressed Air and Instrument	-	270	-	-	-	-	-	40	310	-	-	310	-	-	-	-	-	-	6,089	-
2b.1.1.27	KB - Breathing Air	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,075	-
2b.1.1.28	KC - Fire Protection RCA	-	351	12	88	693	-	-	206	1,350	1,350	-	-	5,944	-	-	-	-	241,384	6,383	-
2b.1.1.29	KD - Domestic Water	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	1,708	-
2b.1.1.30	KE - Fuel Hndlg & Strg Reactor Vssl Serv	-	20	4	15	77	52	-	32	200	200	-	-	661	158	-	-	-	36,889	375	-
2b.1.1.31	KJ - Standby Diesel Engine	-	332	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	6,749	-
2b.1.1.32	LA - Sanitary Drains RCA	-	26	1	4	32	-	-	12	74	74	-	-	272	-	-	-	-	11,053	422	-
2b.1.1.33	LB - Roof Drains	-	56	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	1,276	-
2b.1.1.34	LB - Roof Drains RCA	-	146	4	32	249	-	-	79	511	511	-	-	2,139	-	-	-	-	86,858	2,694	-
2b.1.1.35	LC - Yard Drains	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	96	-
2b.1.1.36	LD - Chemical & Detergent Waste	77	119	6	15	59	69	-	97	441	441	-	-	504	211	-	-	-	33,951	3,490	-
2b.1.1.37	LF - Floor & Equipment Drains	-	1,488	127	246	436	1,878	-	956	5,130	5,130	-	-	3,739	5,724	-	-	-	516,484	29,320	-
2b.1.1.38	Main Access Facility	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	339	-
2b.1.1.39	Radwaste Bldg Non-System Specific RCA	-	1,176	26	188	1,478	-	-	547	3,415	3,415	-	-	12,684	-	-	-	-	515,103	21,919	-
2b.1.1.40	Reactor Bldg Non-System Specific	-	93	4	10	31	61	-	45	245	245	-	-	269	186	-	-	-	22,727	1,760	-
2b.1.1.41	Reactor Bldg Non-System Specific RCA	-	593	10	71	556	-	-	243	1,472	1,472	-	-	4,768	-	-	-	-	193,612	10,425	-
2b.1.1.42	SBO Diesel Generator	-	177	-	-	-	-	-	27	204	-	-	204	-	-	-	-	-	-	3,610	-
2b.1.1.43	ST - Sewage Treatment	-	107	-	-	-	-	-	16	124	-	-	124	-	-	-	-	-	-	2,316	-
2b.1.1.44	VC - Health Physics Computer Room HVAC	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	208	-
2b.1.1.45	VS - Admin Bldg HVAC	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	262	-
2b.1.1.46	VT - Tech Support Building HVAC	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	87	-
2b.1.1.47	VW - Waste Water Treatment Ventilation	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	52	-
2b.1.1.48	WD - Domestic Water	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	870	-
2b.1.1.49	WS - Plant Services Water RCA	-	39	4	27	214	-	-	46	331	331	-	-	1,838	-	-	-	-	74,625	782	-
2b.1.1.50	WT - Waste Water Treatment	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	769	-
2b.1.1.51	WZ - Radioactive Liquid Waste	-	47	5	10	14	85	-	37	199	199	-	-	120	258	-	-	-	21,303	879	-
2b.1.1	Totals	1,978	10,607	610	1,825	9,038	6,672	-	6,824	37,554	35,543	-	2,012	77,549	20,271	-	-	-	4,444,833	232,233	-
2b.1.2	Scaffolding in support of decommissioning	-	1,778	34	29	195	43	-	492	2,572	2,572	-	-	1,508	133	-	-	-	76,290	46,205	-

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,230	1,175	64	518	694	2,354	-	1,686	7,721	7,721	-	-	5,955	17,517	-	-	-	997,209	44,353	-
2b.1.3.2	Auxiliary	613	408	28	238	255	444	-	596	2,582	2,582	-	-	2,185	6,943	-	-	-	417,552	19,560	-
2b.1.3.3	Communication Corridor - Contaminated	14	7	1	5	2	9	-	12	49	49	-	-	17	152	-	-	-	7,854	395	-
2b.1.3.4	Hot Machine Shop	17	14	1	6	-	11	-	16	64	64	-	-	-	188	-	-	-	8,892	597	-
2b.1.3.5	RWST Foundation Decon	-	8	1	10	-	20	-	9	49	49	-	-	-	335	-	-	-	15,840	108	-
2b.1.3.6	Radwaste	326	193	14	122	98	233	-	304	1,291	1,291	-	-	844	3,681	-	-	-	208,617	10,005	-
2b.1.3.7	Radwaste Drum Storage	37	20	2	13	8	26	-	33	138	138	-	-	66	413	-	-	-	22,243	1,093	-
2b.1.3.8	Radwaste Storage Building	94	41	4	33	-	66	-	79	316	316	-	-	-	1,090	-	-	-	51,480	2,634	-
2b.1.3	Totals	2,330	1,865	114	945	1,057	3,164	-	2,734	12,210	12,210	-	-	9,068	30,319	-	-	-	1,729,687	78,745	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	536	80	616	616	-	-	-	-	-	-	-	-	-	4,096
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	4,308	14,250	757	2,800	10,290	9,880	536	10,131	52,952	50,940	-	2,012	88,124	50,723	-	-	-	6,250,810	357,184	4,096
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	780	234	1,014	1,014	-	-	-	-	-	-	-	-	17,312	-
2b.2	Subtotal Period 2b Additional Costs	-	-	-	-	-	-	780	234	1,014	1,014	-	-	-	-	-	-	-	-	17,312	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	212	-	153	258	-	595	-	308	1,526	1,526	-	-	-	1,244	-	-	-	74,611	242	-
2b.3.2	Process decommissioning chemical flush waste	4	-	158	491	-	1,136	-	375	2,165	2,165	-	-	-	1,338	-	-	-	142,540	250	-
2b.3.3	Small tool allowance	-	279	-	-	-	-	-	42	321	321	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	25,778	3,867	29,645	-	29,645	-	-	-	-	-	-	-	-	-
2b.3.5	On-site survey and release of 39.39 tons clean metallic waste	-	-	-	-	-	-	57	6	62	62	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	216	279	312	748	-	1,731	25,835	4,598	33,718	4,073	29,645	-	-	2,581	-	-	-	217,152	493	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,845	-	-	-	-	-	-	461	2,306	2,306	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	519	52	571	571	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	3,074	307	3,382	3,382	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	3,830	-	-	-	-	-	958	4,788	4,788	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	1,898	-	-	-	-	-	285	2,183	2,183	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	104	82	-	289	-	95	569	569	-	-	-	5,037	-	-	-	100,731	164	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	1,543	231	1,774	1,774	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	560	56	616	616	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	694	69	764	-	764	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	823	123	947	-	947	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	208	31	239	239	-	-	-	-	-	-	-	-	-	-
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	105	16	121	-	121	-	-	-	-	-	-	-	-	-
2b.4.13	Corporate A&G Cost	-	-	-	-	-	-	362	54	417	417	-	-	-	-	-	-	-	-	-	-
2b.4.14	NEI Annual Fees	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	-
2b.4.15	Security Staff Cost	-	-	-	-	-	-	12,660	1,899	14,559	14,559	-	-	-	-	-	-	-	-	-	206,154
2b.4.16	DOC Staff Cost	-	-	-	-	-	-	12,211	1,832	14,042	14,042	-	-	-	-	-	-	-	-	-	126,464
2b.4.17	Utility Staff Cost	-	-	-	-	-	-	19,571	2,936	22,506	22,506	-	-	-	-	-	-	-	-	-	234,738
2b.4	Subtotal Period 2b Period-Dependent Costs	1,845	5,728	104	82	-	289	52,810	9,477	70,335	68,503	1,831	-	-	5,037	-	-	-	100,731	164	567,356
2b.0	TOTAL PERIOD 2b COST	6,368	20,257	1,173	3,630	10,290	11,900	79,961	24,440	158,018	124,531	31,476	2,012	88,124	58,341	-	-	-	6,568,693	375,153	571,452
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	690	76	266	207	-	2,045	-	933	4,217	4,217	-	-	-	6,250	-	-	-	397,077	1,722	-
Disposal of Plant Systems																					
2d.1.2.1	EC - Fuel Pool Cooling & Cleanup	-	403	29	75	303	358	-	250	1,417	1,417	-	-	2,600	1,088	-	-	-	175,058	8,041	-
2d.1.2.2	Fuel Bldg Non-System Specific	-	49	3	7	20	39	-	26	144	144	-	-	170	120	-	-	-	14,568	954	-
2d.1.2.3	Fuel Bldg Non-System Specific RCA	-	321	6	47	373	-	-	144	892	892	-	-	3,200	-	-	-	-	129,974	5,859	-
2d.1.2.4	Fuel Building Fire Protection	-	155	6	44	343	-	-	97	645	645	-	-	2,941	-	-	-	-	119,444	2,802	-
2d.1.2.5	GG - Fuel Building HVAC	-	256	11	60	435	51	-	152	964	964	-	-	3,729	155	-	-	-	161,297	4,673	-
2d.1.2	Totals	-	1,184	54	233	1,473	448	-	669	4,062	4,062	-	-	12,641	1,364	-	-	-	600,340	22,329	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Building	862	877	14	91	315	142	-	748	3,052	3,052	-	-	2,705	1,864	-	-	-	199,762	31,564	-
2d.1.3	Totals	862	877	14	91	315	142	-	748	3,052	3,052	-	-	2,705	1,864	-	-	-	199,762	31,564	-
2d.1.4	Scaffolding in support of decommissioning	-	356	7	6	39	9	-	98	514	514	-	-	302	27	-	-	-	15,258	9,241	-

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
2d.1	Subtotal Period 2d Activity Costs	1,552	2,493	342	537	1,828	2,644	-	2,449	11,844	11,844	-	-	15,647	9,505	-	-	-	1,212,437	64,856	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,688	507	2,195	2,195	-	-	-	-	-	-	-	-	-	12,480
2d.2.2	Operational Tools & Equipment	-	-	22	146	839	-	-	150	1,158	1,158	-	-	11,700	-	-	-	-	292,500	32	-
2d.2.3	Excavation of Underground Services	-	2,174	-	-	-	-	687	646	3,507	3,507	-	-	-	-	-	-	-	-	14,181	-
2d.2.4	Remedial Action Surveys	-	-	-	-	-	-	631	189	821	821	-	-	-	-	-	-	-	-	14,009	-
2d.2	Subtotal Period 2d Additional Costs	-	2,174	22	146	839	-	3,007	1,492	7,681	7,681	-	-	11,700	-	-	-	-	292,500	28,222	12,480
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	112	-	82	137	-	317	-	164	811	811	-	-	-	662	-	-	-	39,712	129	-
2d.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2d.3.3	Small tool allowance	-	80	-	-	-	-	-	12	92	92	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	135	132	775	173	-	193	1,408	1,408	-	-	6,000	529	-	-	-	303,608	147	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	327	49	376	-	376	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	112	80	217	269	775	490	327	418	2,686	2,310	376	-	6,000	1,191	-	-	-	343,320	276	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	281	-	-	-	-	-	-	70	351	351	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	420	42	462	462	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	1,018	102	1,120	1,120	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	1,269	-	-	-	-	-	317	1,586	1,586	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,536	-	-	-	-	-	230	1,766	1,766	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	43	33	-	119	-	39	234	234	-	-	-	2,066	-	-	-	41,322	67	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	666	100	766	766	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	427	43	470	470	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	562	56	618	-	618	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	336	50	386	386	-	-	-	-	-	-	-	-	-	-
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	85	13	98	-	98	-	-	-	-	-	-	-	-	-
2d.4.12	Corporate A&G Cost	-	-	-	-	-	-	207	31	238	238	-	-	-	-	-	-	-	-	-	-
2d.4.13	Security Staff Cost	-	-	-	-	-	-	7,324	1,099	8,423	5,079	3,344	-	-	-	-	-	-	-	-	113,551
2d.4.14	DOC Staff Cost	-	-	-	-	-	-	6,859	1,029	7,888	7,888	-	-	-	-	-	-	-	-	-	70,093
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	11,531	1,730	13,260	12,279	981	-	-	-	-	-	-	-	-	133,878
2d.4	Subtotal Period 2d Period-Dependent Costs	281	2,804	43	33	-	119	29,434	4,950	37,664	32,623	5,041	-	-	2,066	-	-	-	41,322	67	317,522
2d.0	TOTAL PERIOD 2d COST	1,944	7,550	623	986	3,442	3,252	32,768	9,309	59,875	54,458	5,417	-	33,347	12,762	-	-	-	1,889,580	93,421	330,002
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	164	49	213	213	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license									a											
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	164	49	213	213	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	8,039	2,412	10,450	10,450	-	-	-	-	-	-	-	-	153,690	6,240
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	8,039	2,412	10,450	10,450	-	-	-	-	-	-	-	-	153,690	6,240
Period 2f Collateral Costs																					
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,398	210	1,608	1,608	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	363	54	418	-	418	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	1,761	264	2,025	1,608	418	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																					
2f.4.1	Insurance	-	-	-	-	-	-	483	48	532	532	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	1,171	117	1,288	1,288	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	1,333	-	-	-	-	-	333	1,667	1,667	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	8	6	-	21	-	7	41	41	-	-	-	365	-	-	-	7,304	12	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	383	57	440	440	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	522	52	574	574	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	646	65	711	-	711	-	-	-	-	-	-	-	-	-
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	98	15	113	-	113	-	-	-	-	-	-	-	-	-
2f.4.9	Corporate A&G Cost	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	-
2f.4.10	Security Staff Cost	-	-	-	-	-	-	8,426	1,264	9,689	5,843	3,847	-	-	-	-	-	-	-	-	130,630
2f.4.11	DOC Staff Cost	-	-	-	-	-	-	5,964	895	6,858	6,858	-	-	-	-	-	-	-	-	-	58,864
2f.4.12	Utility Staff Cost	-	-	-	-	-	-	7,527	1,129	8,657	7,531	1,125	-	-	-	-	-	-	-	-	83,055
2f.4	Subtotal Period 2f Period-Dependent Costs	-	1,333	8	6	-	21	25,348	4,001	30,717	24,922	5,796	-	-	365	-	-	-	7,304	12	272,548
2f.0	TOTAL PERIOD 2f COST	-	1,333	8	6	-	21	35,312	6,726	43,406	37,193	6,214	-	-	365	-	-	-	7,304	153,702	278,788

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 2 TOTALS		10,619	82,568	28,253	15,106	28,255	54,915	278,272	106,036	604,023	527,566	66,757	9,700	252,571	152,795	963	393	-	19,956,780	1,141,376	2,360,515
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	3,121	-	-	-	-	-	468	3,589	-	-	3,589	-	-	-	-	-	-	27,724	-
3b.1.1.2	Access Vaults	-	11	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	59	-
3b.1.1.3	Administration	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	1,724	-
3b.1.1.4	Auxiliary	-	2,695	-	-	-	-	-	404	3,099	-	-	3,099	-	-	-	-	-	-	19,753	-
3b.1.1.5	Auxiliary Boiler	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	248	-
3b.1.1.6	Chemical Addition Structure	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	469	-
3b.1.1.7	Circ Water Pump Enclosure	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	164	-
3b.1.1.8	Circ Water Travel Screen Enclosure	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	160	-
3b.1.1.9	Circulating Water Discharge Structure	-	99	-	-	-	-	-	15	114	-	-	114	-	-	-	-	-	-	542	-
3b.1.1.10	Circulating Water Intake & Screenhouse	-	94	-	-	-	-	-	14	108	-	-	108	-	-	-	-	-	-	683	-
3b.1.1.11	Communication Corridor - Clean	-	970	-	-	-	-	-	145	1,115	-	-	1,115	-	-	-	-	-	-	8,280	-
3b.1.1.12	Communication Corridor - Contaminated	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	184	-
3b.1.1.13	Covered Walkways	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	242	-
3b.1.1.14	Diesel Generator	-	302	-	-	-	-	-	45	347	-	-	347	-	-	-	-	-	-	2,185	-
3b.1.1.15	E.S.W.S. Pumphouse	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	801	-
3b.1.1.16	ESWS Valve House	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	42	-
3b.1.1.17	FLEX Building No. 1 & 2	-	429	-	-	-	-	-	64	493	-	-	493	-	-	-	-	-	-	2,880	-
3b.1.1.18	GOB - Administration Building	-	235	-	-	-	-	-	35	270	-	-	270	-	-	-	-	-	-	2,962	-
3b.1.1.19	Hot Machine Shop	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	243	-
3b.1.1.20	M.M.O. Building	-	315	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	2,389	-
3b.1.1.21	Main Access Facility	-	500	-	-	-	-	-	75	575	-	-	575	-	-	-	-	-	-	4,717	-
3b.1.1.22	Material Center West	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	1,379	-
3b.1.1.23	Misc Structures and Additions	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	910	-
3b.1.1.24	Miscellaneous Site Foundations	-	225	-	-	-	-	-	34	259	-	-	259	-	-	-	-	-	-	1,242	-
3b.1.1.25	Miscellaneous Site Structures	-	1,799	-	-	-	-	-	270	2,069	-	-	2,069	-	-	-	-	-	-	13,693	-
3b.1.1.26	New Covered Walkway	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	79	-
3b.1.1.27	Oil Separator and Waste Tank	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	8	-
3b.1.1.28	Radwaste	-	1,091	-	-	-	-	-	164	1,254	-	-	1,254	-	-	-	-	-	-	8,111	-
3b.1.1.29	Radwaste Drum Storage	-	149	-	-	-	-	-	22	171	-	-	171	-	-	-	-	-	-	1,449	-
3b.1.1.30	Radwaste Storage Building	-	82	-	-	-	-	-	12	94	-	-	94	-	-	-	-	-	-	1,028	-
3b.1.1.31	SBO Diesel Generator	-	360	-	-	-	-	-	54	414	-	-	414	-	-	-	-	-	-	3,079	-
3b.1.1.32	Security Main Gate North	-	107	-	-	-	-	-	16	124	-	-	124	-	-	-	-	-	-	1,123	-
3b.1.1.33	Security Additions	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	405	-
3b.1.1.34	Security/Guardhouse	-	35	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	342	-
3b.1.1.35	Site Diesel Generator	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	18	-
3b.1.1.36	Support Complex	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	389	-
3b.1.1.37	Turbine Building	-	4,242	-	-	-	-	-	636	4,878	-	-	4,878	-	-	-	-	-	-	47,075	-
3b.1.1.38	Turbine Pedestal	-	527	-	-	-	-	-	79	607	-	-	607	-	-	-	-	-	-	2,934	-
3b.1.1.39	Waste Water Treatment	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	172	-
3b.1.1.40	Water Treatment Building North (Z110)	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	608	-
3b.1.1.41	Fuel Building	-	1,108	-	-	-	-	-	166	1,275	-	-	1,275	-	-	-	-	-	-	7,874	-
3b.1.1	Totals	-	19,264	-	-	-	-	-	2,890	22,154	-	-	22,154	-	-	-	-	-	-	168,368	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,163	-	-	-	-	-	174	1,337	-	-	1,337	-	-	-	-	-	-	5,660	-
3b.1.3	Grade & landscape site	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	512	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	204	31	235	235	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	20,535	-	-	-	-	204	3,111	23,849	235	-	23,615	-	-	-	-	-	-	174,540	1,560
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	1,168	-	-	-	-	19	178	1,365	-	-	1,365	-	-	-	-	-	-	4,700	-
Period 3b Additional Costs (continued)																					
3b.2.2	Circulating Water Intake Cofferdam	-	341	-	-	-	-	-	51	392	-	-	392	-	-	-	-	-	-	2,584	-
3b.2.3	Construction Debris	-	-	-	-	-	-	2,250	338	2,588	-	-	2,588	-	-	-	-	-	-	-	-
3b.2.4	E.S.W.S. Pumphouse Cofferdam	-	447	-	-	-	-	-	67	514	-	-	514	-	-	-	-	-	-	3,552	-
3b.2.5	Firing Range Closure	-	-	-	-	-	-	848	127	975	-	-	975	-	-	-	-	-	-	-	-
3b.2	Subtotal Period 3b Additional Costs	-	1,956	-	-	-	-	3,117	761	5,834	-	-	5,834	-	-	-	-	-	-	10,836	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	168	-	-	-	-	-	25	194	-	-	194	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	633	95	728	-	728	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	168	-	-	-	-	633	120	922	-	728	194	-	-	-	-	-	-	-	-

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Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	927	93	1,020	1,020	-	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	1,540	154	1,694	-	1,694	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	4,738	-	-	-	-	-	711	5,448	-	-	5,448	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	367	55	422	-	422	-	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	553	-	553	-	553	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	1,240	124	1,364	-	1,364	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	188	28	216	-	216	-	-	-	-	-	-	-	-	-
3b.4.8	Corporate A&G Cost	-	-	-	-	-	-	130	20	150	37	113	-	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	8,635	1,295	9,931	(0)	7,388	2,542	-	-	-	-	-	-	-	126,869
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	10,920	1,638	12,559	-	-	12,559	-	-	-	-	-	-	-	105,208
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	7,354	1,103	8,457	(0)	2,157	6,300	-	-	-	-	-	-	-	84,321
3b.4	Subtotal Period 3b Period-Dependent Costs	-	4,738	-	-	-	-	31,855	5,221	41,814	1,057	13,907	26,850	-	-	-	-	-	-	-	316,398
3b.0	TOTAL PERIOD 3b COST	-	27,396	-	-	-	-	35,810	9,213	72,419	1,292	14,635	56,492	-	-	-	-	-	-	185,376	317,958
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	14,415	2,162	16,577	-	16,577	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	14,415	2,162	16,577	-	16,577	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	16,738	1,674	18,411	-	18,411	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	27,791	2,779	30,571	-	30,571	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	9,983	-	9,983	-	9,983	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	22,386	2,239	24,624	-	24,624	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	3,398	510	3,908	-	3,908	-	-	-	-	-	-	-	-	-
3c.4.7	Corporate A&G Cost	-	-	-	-	-	-	582	87	669	-	669	-	-	-	-	-	-	-	-	-
3c.4.8	Security Staff Cost	-	-	-	-	-	-	115,900	17,385	133,284	-	133,284	-	-	-	-	-	-	-	-	1,731,597
3c.4.9	Utility Staff Cost	-	-	-	-	-	-	33,876	5,081	38,958	-	38,958	-	-	-	-	-	-	-	-	377,041
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	230,654	29,755	260,408	-	260,408	-	-	-	-	-	-	-	-	2,108,639
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	245,069	31,917	276,986	-	276,986	-	-	-	-	-	-	-	-	2,108,639
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,163	-	-	14,438	-	2,456	18,056	18,056	-	-	-	-	-	-	2,217	433,180	-	-
3d.1.1	Totals	-	-	1,163	-	-	14,438	-	2,456	18,056	18,056	-	-	-	-	-	-	2,217	433,180	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,163	-	-	14,438	-	2,456	18,056	18,056	-	-	-	-	-	-	2,217	433,180	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	24	2	26	26	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	40	4	44	44	-	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	10	-	10	-	10	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	32	3	35	-	35	-	-	-	-	-	-	-	-	-
3d.4.6	ISFSI Operating Costs	-	-	-	-	-	-	5	1	6	-	6	-	-	-	-	-	-	-	-	-
3d.4.7	Corporate A&G Cost	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
3d.4.8	Security Staff Cost	-	-	-	-	-	-	166	25	190	190	-	-	-	-	-	-	-	-	-	2,473
3d.4.9	Utility Staff Cost	-	-	-	-	-	-	48	7	56	56	-	-	-	-	-	-	-	-	-	539
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	325	42	367	317	51	-	-	-	-	-	-	-	-	3,012
3d.0	TOTAL PERIOD 3d COST	-	-	1,163	-	-	14,438	325	2,499	18,424	18,373	51	-	-	-	-	-	2,217	433,180	-	3,012
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	License Termination ISFSI	-	65	221	1,895	-	4,096	1,989	2,067	10,333	10,333	-	-	-	23,409	-	-	-	2,971,239	8,091	2,225
3e.2	Subtotal Period 3e Additional Costs	-	65	221	1,895	-	4,096	1,989	2,067	10,333	10,333	-	-	-	23,409	-	-	-	2,971,239	8,091	2,225

Table C
Wolf Creek Generating Station
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	140	35	175	175	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	343	86	429	429	-	-	-	-	-	-	-	-	-	-
3e.4.3	Plant energy budget	-	-	-	-	-	-	16	4	20	20	-	-	-	-	-	-	-	-	-	-
3e.4.4	Corporate A&G Cost	-	-	-	-	-	-	6	1	7	7	-	-	-	-	-	-	-	-	-	-
3e.4.5	Security Staff Cost	-	-	-	-	-	-	356	89	445	445	-	-	-	-	-	-	-	-	-	4,999
3e.4.6	Utility Staff Cost	-	-	-	-	-	-	339	85	424	424	-	-	-	-	-	-	-	-	-	3,792
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	1,201	300	1,501	1,501	-	-	-	-	-	-	-	-	-	8,792
3e.0	TOTAL PERIOD 3e COST	-	65	221	1,895	-	4,096	3,190	2,367	11,834	11,834	-	-	-	23,409	-	-	-	2,971,239	8,091	11,017
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	Site Restoration ISFSI	-	1,292	-	-	-	-	612	286	2,189	-	-	2,189	-	-	-	-	-	-	5,501	160
3f.2	Subtotal Period 3f Additional Costs	-	1,292	-	-	-	-	612	286	2,189	-	-	2,189	-	-	-	-	-	-	5,501	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	170	17	187	-	-	187	-	-	-	-	-	-	-	-
3f.4.3	Plant energy budget	-	-	-	-	-	-	8	1	9	-	-	9	-	-	-	-	-	-	-	-
3f.4.4	Corporate A&G Cost	-	-	-	-	-	-	2	0	3	-	-	3	-	-	-	-	-	-	-	-
3f.4.5	Security Staff Cost	-	-	-	-	-	-	176	26	203	-	-	203	-	-	-	-	-	-	-	2,479
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	136	20	156	-	-	156	-	-	-	-	-	-	-	1,539
3f.4	Subtotal Period 3f Period-Dependent Costs	-	-	-	-	-	-	493	65	558	-	-	558	-	-	-	-	-	-	-	4,018
3f.0	TOTAL PERIOD 3f COST	-	1,299	-	-	-	-	1,104	352	2,756	-	-	2,756	-	-	-	-	-	-	5,501	4,178
PERIOD 3 TOTALS		-	28,760	1,384	1,895	-	18,534	285,498	46,347	382,418	31,499	291,671	59,248	-	23,409	-	-	2,217	3,404,419	198,968	2,444,803
TOTAL COST TO DECOMMISSION		15,385	115,105	29,924	17,423	28,313	76,466	711,760	176,988	1,171,364	736,220	364,576	70,567	264,361	177,453	1,750	393	2,217	23,619,230	1,361,484	6,036,298

TOTAL COST TO DECOMMISSION WITH 17.8% CONTINGENCY:	**$1,171,364**	**thousands of 2023 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 62.85% OR:	**$736,220**	**thousands of 2023 dollars**
SPENT FUEL MANAGEMENT COST IS 31.12% OR:	**$364,576**	**thousands of 2023 dollars**
NON-NUCLEAR DEMOLITION COST IS 6.02% OR:	**$70,567**	**thousands of 2023 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**179,596**	**Cubic Feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**2,217**	**Cubic Feet**
TOTAL SCRAP METAL REMOVED:	**69,944**	**Tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**1,361,484**	**Man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

APPENDIX D

DETAILED COST ANALYSIS

SAFSTOR

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	354	106	460	460	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	262	39	301	301	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	196	29	226	226	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	405	61	466	466	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	654	98	752	752	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	643	97	740	740	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	545	82	627	627	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	262	39	301	301	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	262	39	301	301	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	2,119	318	2,437	2,437	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	155	23	178	178	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	157	24	180	180	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	312	47	358	358	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	13	2	15	15	-	-	-	-	-	-	-	-	-	100
1a.1.19	Drain/de-energize non-cont. systems									a											
1a.1.20	Drain & dry NSSS									a											
1a.1.21	Drain/de-energize contaminated systems									a											
1a.1.22	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	5,047	810	5,857	5,857	-	-	-	-	-	-	-	-	-	35,890
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	440	66	505	-	505	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	440	66	505	-	505	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	3,210	321	3,531	3,531	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	3,691	369	4,060	4,060	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	888	-	-	-	-	-	222	1,110	1,110	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	657	-	-	-	-	-	99	755	755	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	13	10	-	35	-	11	69	69	-	-	-	610	-	-	-	12,190	20	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,469	370	2,840	2,840	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	997	100	1,097	1,097	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	1,448	145	1,593	-	1,593	-	-	-	-	-	-	-	-	-
1a.4.9	INPO Fees	-	-	-	-	-	-	358	54	411	411	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	988	148	1,136	-	1,136	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	127	19	146	-	146	-	-	-	-	-	-	-	-	-
1a.4.12	Corporate A&G Cost	-	-	-	-	-	-	655	98	753	753	-	-	-	-	-	-	-	-	-	-
1a.4.13	NEI Annual Fees	-	-	-	-	-	-	577	87	664	664	-	-	-	-	-	-	-	-	-	-
1a.4.14	Security Staff Cost	-	-	-	-	-	-	17,743	2,661	20,404	20,404	-	-	-	-	-	-	-	-	-	277,740
1a.4.15	Utility Staff Cost	-	-	-	-	-	-	33,657	5,049	38,706	38,706	-	-	-	-	-	-	-	-	-	422,240
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,545	13	10	-	35	65,920	9,753	77,274	74,399	2,875	-	-	610	-	-	-	12,190	20	699,980
1a.0	TOTAL PERIOD 1a COST	-	1,545	13	10	-	35	71,406	10,629	83,637	80,256	3,381	-	-	610	-	-	-	12,190	20	735,870

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,213	-	-	-	-	-	-	607	1,820	1,820	-	-	-	-	-	-	-	-	24,102	-
1b.1.1.2	Auxiliary	577	-	-	-	-	-	-	288	865	865	-	-	-	-	-	-	-	-	12,527	-
1b.1.1.3	Communication Corridor - Contaminated	13	-	-	-	-	-	-	6	19	19	-	-	-	-	-	-	-	-	276	-
1b.1.1.4	Fuel Building	852	-	-	-	-	-	-	426	1,278	1,278	-	-	-	-	-	-	-	-	14,371	-
1b.1.1.5	Hot Machine Shop	16	-	-	-	-	-	-	8	24	24	-	-	-	-	-	-	-	-	344	-
1b.1.1.6	Radwaste	307	-	-	-	-	-	-	154	461	461	-	-	-	-	-	-	-	-	6,671	-
1b.1.1.7	Radwaste Drum Storage	35	-	-	-	-	-	-	17	52	52	-	-	-	-	-	-	-	-	750	-
1b.1.1.8	Radwaste Storage Building	88	-	-	-	-	-	-	44	132	132	-	-	-	-	-	-	-	-	1,901	-
1b.1.1	Totals	3,100	-	-	-	-	-	-	1,550	4,650	4,650	-	-	-	-	-	-	-	-	60,943	-
1b.1	Subtotal Period 1b Activity Costs	3,100	-	-	-	-	-	-	1,550	4,650	4,650	-	-	-	-	-	-	-	-	60,943	-
Period 1b Additional Costs																					
1b.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	14,330	2,150	16,480	16,480	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	14,330	2,150	16,480	16,480	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	1,193	-	-	-	-	-	-	179	1,371	1,371	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	190	-	134	225	-	520	-	272	1,341	1,341	-	-	-	1,087	-	-	-	65,213	212	-
1b.3.3	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1b.3.4	Small tool allowance	-	51	-	-	-	-	-	8	59	59	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	580	87	667	-	667	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,383	51	134	225	-	520	580	546	3,438	2,771	667	-	-	1,087	-	-	-	65,213	212	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,843	-	-	-	-	-	-	461	2,304	2,304	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	800	80	880	880	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	920	92	1,012	1,012	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	724	-	-	-	-	-	181	905	905	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	164	-	-	-	-	-	25	188	188	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	16	12	-	43	-	14	85	85	-	-	-	754	-	-	-	15,078	25	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	616	92	708	708	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	185	18	203	203	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	361	36	397	-	397	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	246	37	283	-	283	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	32	5	36	-	36	-	-	-	-	-	-	-	-	-
1b.4.12	Corporate A&G Cost	-	-	-	-	-	-	163	24	188	188	-	-	-	-	-	-	-	-	-	-
1b.4.13	NEI Annual Fees	-	-	-	-	-	-	144	22	165	165	-	-	-	-	-	-	-	-	-	-
1b.4.14	Security Staff Cost	-	-	-	-	-	-	4,373	656	5,029	5,029	-	-	-	-	-	-	-	-	-	68,452
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	8,391	1,259	9,650	9,650	-	-	-	-	-	-	-	-	-	105,271
1b.4	Subtotal Period 1b Period-Dependent Costs	1,843	888	16	12	-	43	16,232	3,002	22,035	21,319	717	-	-	754	-	-	-	15,078	25	173,723
1b.0	TOTAL PERIOD 1b COST	6,326	939	150	237	-	563	31,142	7,247	46,603	45,220	1,383	-	-	1,841	-	-	-	80,291	61,179	173,723
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	543	-	-	-	-	-	81	624	624	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	45	-	-	-	-	-	7	52	52	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	15,309	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	76	11	88	88	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	588	-	-	-	-	809	320	1,717	1,717	-	-	-	-	-	-	-	-	19,009	583
Period 1c Collateral Costs																					
1c.3.1	Process decommissioning water waste	207	-	146	245	-	566	-	296	1,460	1,460	-	-	-	1,184	-	-	-	71,035	231	-
1c.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1c.3.3	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	580	87	667	-	667	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	207	4	146	245	-	566	580	384	2,132	1,465	667	-	-	1,184	-	-	-	71,035	231	-

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	800	80	880	880	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	920	92	1,012	1,012	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	380	-	-	-	-	-	95	474	474	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	164	-	-	-	-	-	25	188	188	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	2	-	9	-	3	17	17	-	-	-	152	-	-	-	3,039	5	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	616	92	708	708	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	185	18	203	203	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	361	36	397	-	397	-	-	-	-	-	-	-	-	-
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	246	37	283	-	283	-	-	-	-	-	-	-	-	-
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	32	5	36	-	36	-	-	-	-	-	-	-	-	-
1c.4.11	Corporate A&G Cost	-	-	-	-	-	-	163	24	188	188	-	-	-	-	-	-	-	-	-	-
1c.4.12	NEI Annual Fees	-	-	-	-	-	-	144	22	165	165	-	-	-	-	-	-	-	-	-	-
1c.4.13	Security Staff Cost	-	-	-	-	-	-	4,373	656	5,029	5,029	-	-	-	-	-	-	-	-	-	68,452
1c.4.14	Utility Staff Cost	-	-	-	-	-	-	8,391	1,259	9,650	9,650	-	-	-	-	-	-	-	-	-	105,271
1c.4	Subtotal Period 1c Period-Dependent Costs	-	543	3	2	-	9	16,232	2,444	19,233	18,516	717	-	-	152	-	-	-	3,039	5	173,723
1c.0	TOTAL PERIOD 1c COST	207	1,136	149	248	-	575	17,620	3,147	23,082	21,698	1,383	-	-	1,336	-	-	-	74,074	19,245	174,306
PERIOD 1 TOTALS		6,532	3,620	311	495	-	1,173	120,168	21,023	153,322	147,174	6,148	-	-	3,786	-	-	-	166,555	80,444	1,083,899
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	268	40	308	308	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	398	100	498	498	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	666	140	806	806	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	43,056	6,458	49,515	-	49,515	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	43,056	6,458	49,515	-	49,515	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,561	156	1,717	1,717	-	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	9,243	924	10,168	10,168	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	892	-	-	-	-	-	223	1,115	1,115	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	12	9	-	33	-	11	65	65	-	-	-	576	-	-	-	11,523	19	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,237	186	1,422	1,422	-	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	726	73	799	799	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,087	209	2,296	-	2,296	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	2,475	371	2,846	-	2,846	-	-	-	-	-	-	-	-	-
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	317	48	364	-	364	-	-	-	-	-	-	-	-	-
2a.4.10	Corporate A&G Cost	-	-	-	-	-	-	319	48	367	367	-	-	-	-	-	-	-	-	-	-
2a.4.11	NEI Annual Fees	-	-	-	-	-	-	1,445	217	1,662	1,662	-	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	39,477	5,922	45,399	32,959	12,439	-	-	-	-	-	-	-	-	619,817
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	16,957	2,543	19,500	15,873	3,627	-	-	-	-	-	-	-	-	205,738
2a.4	Subtotal Period 2a Period-Dependent Costs	-	892	12	9	-	33	75,844	10,929	87,719	66,147	21,573	-	-	576	-	-	-	11,523	19	825,555
2a.0	TOTAL PERIOD 2a COST	-	892	12	9	-	33	119,566	17,528	138,040	66,953	71,087	-	-	576	-	-	-	11,523	19	825,555
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	3,192	479	3,671	3,671	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	4,745	1,186	5,931	5,931	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	7,937	1,665	9,601	9,601	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	15,830	2,375	18,205	-	18,205	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	15,830	2,375	18,205	-	18,205	-	-	-	-	-	-	-	-	-

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	18,592	1,859	20,451	20,451	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	30,871	3,087	33,958	33,958	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	5,153	-	-	-	-	-	1,288	6,441	6,441	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	68	53	-	189	-	62	373	373	-	-	-	3,297	-	-	-	65,938	108	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	7,366	1,105	8,471	8,471	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	8,314	831	9,146	9,146	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	24,866	2,487	27,352	-	27,352	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	3,775	566	4,341	-	4,341	-	-	-	-	-	-	-	-	-
2b.4.9	Corporate A&G Cost	-	-	-	-	-	-	1,539	231	1,770	1,770	-	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	173,151	25,973	199,124	50,976	148,148	-	-	-	-	-	-	-	-	2,543,914
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	80,607	12,091	92,698	49,408	43,290	-	-	-	-	-	-	-	-	992,747
2b.4	Subtotal Period 2b Period-Dependent Costs	-	5,153	68	53	-	189	349,081	49,580	404,125	180,994	223,132	-	-	3,297	-	-	-	65,938	108	3,536,661
2b.0	TOTAL PERIOD 2b COST	-	5,153	68	53	-	189	372,848	53,620	431,931	190,595	241,336	-	-	3,297	-	-	-	65,938	108	3,536,661
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	2,132	320	2,452	2,452	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	3,169	792	3,962	3,962	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	5,301	1,112	6,414	6,414	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	7,796	780	8,576	8,576	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	20,621	2,062	22,683	22,683	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	3,238	-	-	-	-	-	809	4,047	4,047	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	42	33	-	116	-	38	229	229	-	-	-	2,028	-	-	-	40,565	66	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	4,920	738	5,659	5,659	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	5,092	509	5,601	5,601	-	-	-	-	-	-	-	-	-	-
2c.4.7	Corporate A&G Cost	-	-	-	-	-	-	562	84	647	647	-	-	-	-	-	-	-	-	-	-
2c.4.8	Security Staff Cost	-	-	-	-	-	-	46,718	7,008	53,725	53,725	-	-	-	-	-	-	-	-	-	621,692
2c.4.9	Utility Staff Cost	-	-	-	-	-	-	27,675	4,151	31,826	31,826	-	-	-	-	-	-	-	-	-	362,654
2c.4	Subtotal Period 2c Period-Dependent Costs	-	3,238	42	33	-	116	113,384	16,180	132,993	132,993	-	-	-	2,028	-	-	-	40,565	66	984,346
2c.0	TOTAL PERIOD 2c COST	-	3,238	42	33	-	116	118,685	17,292	139,406	139,406	-	-	-	2,028	-	-	-	40,565	66	984,346
PERIOD 2 TOTALS		-	9,283	122	96	-	339	611,099	88,439	709,377	396,954	312,423	-	-	5,901	-	-	-	118,026	192	5,346,562
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	601	90	692	692	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	981	147	1,128	1,128	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	405	61	466	466	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	981	147	1,128	1,128	-	-	-	-	-	-	-	-	-	7,500
3a.1.9	Perform Site-Specific Cost Study	-	-	-	-	-	-	654	98	752	752	-	-	-	-	-	-	-	-	-	5,000
3a.1.10	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	964	145	1,108	997	-	111	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	545	82	627	564	-	63	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	928	139	1,068	1,068	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	850	127	977	977	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	209	31	241	120	-	120	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	52	8	60	-	-	60	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	408	61	469	235	-	235	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	601	90	692	692	-	-	-	-	-	-	-	-	-	4,600

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Activity Specifications (continued)																					
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	118	18	135	68	-	68	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	5,201	780	5,981	5,265	-	716	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	314	47	361	361	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	4,000	600	4,600	4,600	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	183	27	211	211	-	-	-	-	-	-	-	-	-	1,400
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	161	24	185	185	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	16,882	2,532	19,415	18,699	-	716	-	-	-	-	-	-	-	77,107
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	3,128	938	4,066	4,066	-	-	-	-	-	-	-	-	19,100	7,852
3a.2.2	Misc/Hazardous Waste	-	-	139	58	58	-	-	31	288	288	-	-	11,790	-	-	-	-	137,800	740	-
3a.2	Subtotal Period 3a Additional Costs	-	-	139	58	58	-	3,128	970	4,354	4,354	-	-	11,790	-	-	-	-	137,800	19,840	7,852
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	391	39	430	430	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	1,035	103	1,138	1,138	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	782	-	-	-	-	-	196	978	978	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	657	-	-	-	-	-	99	755	755	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	11	8	-	30	-	10	58	58	-	-	-	514	-	-	-	10,287	17	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	2,469	370	2,840	2,840	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	417	42	459	459	-	-	-	-	-	-	-	-	-	-
3a.4.8	Corporate A&G Cost	-	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	4,346	652	4,998	4,998	-	-	-	-	-	-	-	-	-	65,000
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	21,108	3,166	24,274	24,274	-	-	-	-	-	-	-	-	-	257,920
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,439	11	8	-	30	30,167	4,737	36,391	36,391	-	-	-	514	-	-	-	10,287	17	322,920
3a.0	TOTAL PERIOD 3a COST	-	1,439	150	67	58	30	50,177	8,239	60,160	59,443	-	716	11,790	514	-	-	-	148,087	19,856	407,879
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	619	93	712	641	-	71	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	327	49	376	376	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	177	26	203	51	-	152	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	475	71	546	546	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	157	24	180	90	-	90	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	157	24	180	180	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	601	90	692	692	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	131	20	150	75	-	75	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	204	31	235	-	-	235	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	204	31	235	-	-	235	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	357	54	411	369	-	41	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	357	54	411	369	-	41	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	4,216	632	4,849	3,908	-	940	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	4,216	632	4,849	3,908	-	940	-	-	-	-	-	-	-	32,243
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	1,193	-	-	-	-	-	-	179	1,371	1,371	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,398	210	1,608	1,608	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,400	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	1,193	1,400	-	-	-	-	1,398	599	4,589	4,589	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	43	-	-	-	-	-	-	11	54	54	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	311	31	342	342	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	516	52	568	568	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	426	-	-	-	-	-	107	533	533	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	328	-	-	-	-	-	49	377	377	-	-	-	-	-	-	-	-	-	-

Table D
Wolf Creek Generating Station
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(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.6	Disposal of DAW generated	-	-	6	5	-	17	-	5	33	33	-	-	-	290	-	-	-	5,802	9	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	1,231	185	1,416	1,416	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	208	21	229	229	-	-	-	-	-	-	-	-	-	-
3b.4.9	Corporate A&G Cost	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	2,167	325	2,492	2,492	-	-	-	-	-	-	-	-	-	32,411
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	5,674	851	6,525	6,525	-	-	-	-	-	-	-	-	-	58,080
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	10,525	1,579	12,104	12,104	-	-	-	-	-	-	-	-	-	128,607
3b.4	Subtotal Period 3b Period-Dependent Costs	43	754	6	5	-	17	20,831	3,245	24,901	24,901	-	-	-	290	-	-	-	5,802	9	219,098
3b.0	TOTAL PERIOD 3b COST	1,236	2,154	6	5	-	17	26,445	4,476	34,338	33,398	-	940	-	290	-	-	-	5,802	9	251,341
PERIOD 3 TOTALS		1,236	3,593	156	71	58	46	76,623	12,715	94,498	92,842	-	1,656	11,790	804	-	-	-	153,889	19,866	659,220
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	33	169	40	76	185	368	-	194	1,065	1,065	-	-	967	1,023	-	-	-	135,750	3,982	-
4a.1.1.2	Pressurizer Relief Tank	6	24	11	22	52	104	-	47	265	265	-	-	273	289	-	-	-	38,367	602	-
4a.1.1.3	Reactor Coolant Pumps & Motors	19	84	87	248	-	1,584	-	472	2,496	2,496	-	-	-	4,664	-	-	-	816,140	2,474	80
4a.1.1.4	Pressurizer	-	65	512	172	-	1,270	-	411	2,429	2,429	-	-	-	3,739	-	-	-	241,053	1,346	1,500
4a.1.1.5	Steam Generators	-	8,153	4,022	4,146	3,622	7,657	-	5,520	33,120	33,120	-	-	40,845	22,546	-	-	-	3,398,523	20,611	4,500
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	28	259	249	95	130	595	-	286	1,643	1,643	-	-	1,227	3,012	-	-	-	160,939	5,371	-
4a.1.1.7	Reactor Vessel Internals	40	6,975	9,221	871	-	11,122	295	13,379	41,903	41,903	-	-	-	4,670	501	406	-	336,363	24,023	1,119
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	14,438	-	2,166	16,603	16,603	-	-	-	-	-	-	2,217	433,180	-	-
4a.1.1.9	Reactor Vessel	-	8,773	1,977	1,240	-	5,309	295	10,083	27,677	27,677	-	-	-	15,631	-	-	-	979,036	24,023	1,119
4a.1.1	Totals	126	24,503	16,118	6,870	3,989	42,446	590	32,558	127,200	127,200	-	-	43,312	55,575	501	406	2,217	6,539,352	82,432	8,319
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	460	268	111	878	-	-	290	2,007	2,007	-	-	5,099	-	-	-	-	305,952	8,585	-
4a.1.3	Main Condensers	-	1,306	167	133	1,047	-	-	520	3,173	3,173	-	-	8,106	-	-	-	-	364,767	24,802	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	549	-	-	-	-	-	82	631	631	-	-	-	-	-	-	-	-	4,871	-
4a.1.4.2	Auxiliary	-	299	-	-	-	-	-	45	344	344	-	-	-	-	-	-	-	-	2,194	-
4a.1.4.3	Fuel Building	-	118	-	-	-	-	-	18	135	135	-	-	-	-	-	-	-	-	773	-
4a.1.4.4	Hot Machine Shop	-	1	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	7	-
4a.1.4.5	Radwaste	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	387	-
4a.1.4	Totals	-	1,023	-	-	-	-	-	153	1,176	1,176	-	-	-	-	-	-	-	-	8,233	-
Disposal of Plant Systems																					
4a.1.5.1	AB - Main Steam	-	254	-	-	-	-	-	38	292	-	-	292	-	-	-	-	-	-	5,833	-
4a.1.5.2	AB - Main Steam RCA	-	78	4	32	251	-	-	63	428	428	-	-	2,156	-	-	-	-	87,550	1,515	-
4a.1.5.3	AC - Main Turbine	-	254	-	-	-	-	-	38	292	-	-	292	-	-	-	-	-	-	5,641	-
4a.1.5.4	AD - Condensate	-	287	-	-	-	-	-	43	330	-	-	330	-	-	-	-	-	-	6,144	-
4a.1.5.5	AE - Feedwater	-	195	-	-	-	-	-	29	224	-	-	224	-	-	-	-	-	-	4,271	-
4a.1.5.6	AF - Feedwater Hter Extrction, Drn & Vnt	-	235	-	-	-	-	-	35	270	-	-	270	-	-	-	-	-	-	5,352	-
4a.1.5.7	AK - Condensate Demineralizer	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	1,944	-
4a.1.5.8	AL - Auxiliary Feedwater	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	1,174	-
4a.1.5.9	AL-Auxiliary Feedwater Surge Tanks	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	87	-
4a.1.5.10	AQ - Condensate & Feedwater Chem Additn	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	468	-
4a.1.5.11	AX - Acid Feed	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	754	-
4a.1.5.12	Auxiliary Bldg Non-System Specific	-	104	2	13	96	10	-	45	271	271	-	-	824	31	-	-	-	35,454	2,031	-
4a.1.5.13	Auxiliary Bldg Non-System Specific RCA	-	713	15	113	889	-	-	330	2,060	2,060	-	-	7,629	-	-	-	-	309,812	13,471	-
4a.1.5.14	BL - Reactor Makeup Water	-	270	16	52	295	139	-	156	926	926	-	-	2,529	418	-	-	-	129,620	5,227	-
4a.1.5.15	BM - Steam Generator Blowdown	-	545	10	76	601	-	-	239	1,472	1,472	-	-	5,160	-	-	-	-	209,560	10,703	-
4a.1.5.16	CA - Steam Seal	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	455	-
4a.1.5.17	CB - Main Turbine Lube Oil	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	1,207	-
4a.1.5.18	CC - Generator Hydrogen & CO2	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	198	-
4a.1.5.19	CD - Generator Seal Oil	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	287	-
4a.1.5.20	CE - Stator Cooling Water	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	241	-
4a.1.5.21	CF - Lube Oil Strg, Xfer & Purification	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	812	-
4a.1.5.22	CG - Condenser Air Removal	-	30	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	657	-
4a.1.5.23	CH - Main Turbine Control Oil	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	1,219	-
4a.1.5.24	CL - Chlorination	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	569	-
4a.1.5.25	CO - Carbon Dioxide	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	121	-

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Wolf Creek Generating Station
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.26	CW - Circulating Water	-	347	-	-	-	-	-	52	399	-	-	399	-	-	-	-	-	-	7,858	-
4a.1.5.27	CZ - Caustic Acid	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	111	-
4a.1.5.28	DA - Circulating Water System	-	351	-	-	-	-	-	53	404	-	-	404	-	-	-	-	-	-	7,953	-
4a.1.5.29	DM - Equipment Drains	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,223	-
4a.1.5.30	DM - Equipment Drains RCA	-	148	31	229	1,800	-	-	344	2,552	2,552	-	-	15,445	-	-	-	-	627,223	2,840	-
4a.1.5.31	EG - Component Cooling Water RCA	-	722	29	210	1,650	-	-	462	3,073	3,073	-	-	14,161	-	-	-	-	575,071	13,646	-
4a.1.5.32	EJ - Residual Heat Removal	-	350	34	105	520	383	-	280	1,672	1,672	-	-	4,461	1,166	-	-	-	255,554	7,018	-
4a.1.5.33	EM - High Pressure Coolant Injection	-	283	4	32	252	-	-	114	684	684	-	-	2,159	-	-	-	-	87,663	5,527	-
4a.1.5.34	EN - Containment Spray	-	219	6	45	353	-	-	115	738	738	-	-	3,026	-	-	-	-	122,874	4,134	-
4a.1.5.35	FB - Auxiliary Steam	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	2,106	-
4a.1.5.36	FB - Auxiliary Steam RCA	-	83	2	12	95	-	-	37	229	229	-	-	816	-	-	-	-	33,148	1,537	-
4a.1.5.37	FC - Auxiliary Turbines	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	1,301	-
4a.1.5.38	FE - Auxiliary Steam Chemical Addition	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	105	-
4a.1.5.39	GE - Turbine Bldg HVAC	-	137	-	-	-	-	-	21	157	-	-	157	-	-	-	-	-	-	3,189	-
4a.1.5.40	GF - Miscellaneous Building HVAC	-	41	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	987	-
4a.1.5.41	GS - Containment Hydrogen Control	-	69	2	12	93	-	-	33	209	209	-	-	801	-	-	-	-	32,539	1,395	-
4a.1.5.42	HF - Secondary Liquid Waste	-	906	55	178	983	525	-	537	3,184	3,184	-	-	8,431	1,588	-	-	-	444,251	17,832	-
4a.1.5.43	HY - Hydrogen	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	223	-
4a.1.5.44	KH - Service Gas	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	644	-
4a.1.5.45	LE - Oily Waste	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	2,575	-
4a.1.5.46	LE - Oily Waste RCA	-	194	3	25	200	-	-	83	506	506	-	-	1,718	-	-	-	-	69,785	3,518	-
4a.1.5.47	NT - Nitrogen	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	149	-
4a.1.5.48	OX - Oxygen	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	171	-
4a.1.5.49	SW - Screen Wash	-	32	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	635	-
4a.1.5.50	Turbine Bldg Non-System Specific	-	749	-	-	-	-	-	112	862	-	-	862	-	-	-	-	-	-	15,405	-
4a.1.5.51	VH - Circ Water & Makeup Water Scrnhs	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	272	-
4a.1.5.52	VV - Misc Bldg HVAC	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	148	-
4a.1.5.53	WG - Gland Water & Motor Cooling Water	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	593	-
4a.1.5.54	WL - Cooling Lake Makeup & Blowdown	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	745	-
4a.1.5	Totals	-	8,509	213	1,134	8,079	1,056	-	3,412	22,403	18,006	-	4,397	69,317	3,203	-	-	-	3,020,102	174,218	-
4a.1.6	Scaffolding in support of decommissioning	-	1,306	27	23	156	35	-	365	1,912	1,912	-	-	1,206	106	-	-	-	61,032	33,925	-
4a.1	Subtotal Period 4a Activity Costs	126	37,106	16,794	8,272	14,149	43,537	590	37,299	157,872	153,475	-	4,397	127,040	58,884	501	406	2,217	10,291,210	332,195	8,319
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	27,449	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,237	371	1,608	1,608	-	-	-	-	-	-	-	-	27,449	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	5	-	9	16	-	36	-	15	81	81	-	-	-	76	-	-	-	4,560	15	-
4a.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4a.3.3	Small tool allowance	-	300	-	-	-	-	-	45	346	311	-	35	-	-	-	-	-	-	-	-
4a.3.4	On-site survey and release of 116.8 tons clean metallic waste	-	-	-	-	-	-	168	17	185	185	-	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	5	300	9	16	-	36	168	77	612	577	-	35	-	76	-	-	-	4,560	15	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	114	-	-	-	-	-	-	29	143	143	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	823	82	905	905	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	1,367	137	1,503	1,503	-	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	4,114	-	-	-	-	-	1,028	5,142	5,142	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,935	-	-	-	-	-	440	3,375	3,375	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	103	81	-	286	-	94	563	563	-	-	-	4,980	-	-	-	99,597	162	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	3,098	465	3,563	3,563	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	720	72	792	792	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	658	99	757	757	-	-	-	-	-	-	-	-	-	-
4a.4.10	Corporate A&G Cost	-	-	-	-	-	-	532	80	612	612	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	5,740	861	6,601	6,601	-	-	-	-	-	-	-	-	-	85,836
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	17,935	2,690	20,625	20,625	-	-	-	-	-	-	-	-	-	189,525
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	28,191	4,229	32,420	32,420	-	-	-	-	-	-	-	-	-	343,343
4a.4	Subtotal Period 4a Period-Dependent Costs	114	7,048	103	81	-	286	59,064	10,305	77,001	77,001	-	-	-	4,980	-	-	-	99,597	162	618,703
4a.0	TOTAL PERIOD 4a COST	245	44,455	16,906	8,368	14,149	43,859	61,059	48,052	237,093	232,661	-	4,432	127,040	63,940	501	406	2,217	10,395,360	359,820	627,022

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	627	76	266	207	-	2,045	-	901	4,123	4,123	-	-	-	6,250	-	-	-	397,077	1,722	-
Disposal of Plant Systems																					
4b.1.2.1	AN - Demineralized Wtr Storage & xfer	-	67	-	-	-	-	-	10	78	-	-	78	-	-	-	-	-	-	1,548	-
4b.1.2.2	AN - Demineralized Wtr Strg & xfer RCA	-	19	0	2	14	-	-	7	42	42	-	-	120	-	-	-	-	4,855	334	-
4b.1.2.3	AP - Condensate Storage & Transfer	-	85	-	-	-	-	-	13	98	-	-	98	-	-	-	-	-	-	1,660	-
4b.1.2.4	BB - Reactor Coolant	-	279	28	74	293	367	-	220	1,261	1,261	-	-	2,511	1,121	-	-	-	173,293	5,731	-
4b.1.2.5	BG - Chemical & Volume Control	-	862	77	207	950	853	-	610	3,560	3,560	-	-	8,155	2,586	-	-	-	496,849	17,005	-
4b.1.2.6	BN - Borated Refueling Water Storage	-	312	12	93	729	-	-	202	1,348	1,348	-	-	6,255	-	-	-	-	254,024	6,161	-
4b.1.2.7	Control Bldg Non-System Specific	-	184	4	32	249	-	-	89	557	557	-	-	2,139	-	-	-	-	86,849	3,413	-
4b.1.2.8	Control Bldg Non-System Specific Cln	-	1,380	-	-	-	-	-	207	1,587	-	-	1,587	-	-	-	-	-	-	29,076	-
4b.1.2.9	DO - Diesel Oil	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	48	-
4b.1.2.10	EA - Service Water	-	116	-	-	-	-	-	17	133	-	-	133	-	-	-	-	-	-	2,592	-
4b.1.2.11	EB - Closed Cooling Water	-	55	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	1,267	-
4b.1.2.12	EC - Fuel Pool Cooling & Cleanup	-	367	8	61	480	-	-	174	1,089	1,089	-	-	4,115	-	-	-	-	167,129	7,154	-
4b.1.2.13	EF - Essential Service Water	-	166	-	-	-	-	-	25	191	-	-	191	-	-	-	-	-	-	3,800	-
4b.1.2.14	EF - Essential Service Water RCA	-	90	3	21	166	-	-	51	331	331	-	-	1,427	-	-	-	-	57,959	1,734	-
4b.1.2.15	EP - Accumulator Safety Injection	-	150	4	29	228	-	-	77	488	488	-	-	1,958	-	-	-	-	79,502	2,904	-
4b.1.2.16	FA - Auxiliary Steam Generator	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	521	-
4b.1.2.17	FO - Fuel Oil	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	486	-
4b.1.2.18	FP - Fire Protection	-	171	-	-	-	-	-	26	196	-	-	196	-	-	-	-	-	-	3,826	-
4b.1.2.19	FP - Fire Protection RCA	-	198	9	67	524	-	-	139	936	936	-	-	4,492	-	-	-	-	182,411	3,541	-
4b.1.2.20	Fuel Bldg Non-System Specific	-	45	1	5	37	4	-	19	111	111	-	-	322	12	-	-	-	13,829	850	-
4b.1.2.21	Fuel Bldg Non-System Specific RCA	-	321	6	47	373	-	-	144	892	892	-	-	3,200	-	-	-	-	129,974	5,859	-
4b.1.2.22	Fuel Building Fire Protection	-	155	6	44	343	-	-	97	645	645	-	-	2,941	-	-	-	-	119,444	2,802	-
4b.1.2.23	GA - Plant Heating	-	82	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	1,912	-
4b.1.2.24	GA - Plant Heating RCA	-	114	2	11	87	-	-	43	257	257	-	-	746	-	-	-	-	30,275	2,072	-
4b.1.2.25	GB - Central Chilled Water	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,803	-
4b.1.2.26	GB - Central Chilled Water RCA	-	26	0	3	22	-	-	10	62	62	-	-	187	-	-	-	-	7,591	482	-
4b.1.2.27	GD - Esstl Srvc Wtr Pumphs Bldg HVAC	-	13	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	284	-
4b.1.2.28	GG - Fuel Building HVAC	-	233	8	58	460	-	-	137	896	896	-	-	3,945	-	-	-	-	160,195	4,052	-
4b.1.2.29	GH - Radwaste Building HVAC	-	171	5	38	299	-	-	94	606	606	-	-	2,561	-	-	-	-	104,012	3,004	-
4b.1.2.30	GK - Control Building HVAC	-	156	-	-	-	-	-	23	179	-	-	179	-	-	-	-	-	-	3,959	-
4b.1.2.31	GL - Auxiliary Building HVAC	-	423	11	80	627	-	-	213	1,354	1,354	-	-	5,381	-	-	-	-	218,514	7,364	-
4b.1.2.32	GM - Diesel Generator Building HVAC	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	695	-
4b.1.2.33	GN - Containment Cooling	-	464	16	122	962	-	-	280	1,844	1,844	-	-	8,250	-	-	-	-	335,052	8,317	-
4b.1.2.34	GP - Containmnt Integratd Leak Rate Test	-	40	1	9	68	-	-	22	139	139	-	-	580	-	-	-	-	23,570	750	-
4b.1.2.35	GR - Containment Atmospheric Control	-	18	2	17	133	-	-	27	198	198	-	-	1,143	-	-	-	-	46,407	350	-
4b.1.2.36	GT - Contaiment Purge HVAC	-	109	4	32	255	-	-	71	471	471	-	-	2,185	-	-	-	-	88,746	1,973	-
4b.1.2.37	HA - Gaseous Radwaste	-	333	7	55	431	-	-	157	983	983	-	-	3,699	-	-	-	-	150,219	6,296	-
4b.1.2.38	HB - Liquid Radwaste	-	800	54	158	856	482	-	478	2,828	2,828	-	-	7,343	1,450	-	-	-	391,794	15,380	-
4b.1.2.39	HC - Solid Radwaste	-	443	36	100	465	400	-	299	1,743	1,743	-	-	3,986	1,211	-	-	-	239,489	8,570	-
4b.1.2.40	HD - Decontamination	-	96	2	18	142	-	-	48	307	307	-	-	1,220	-	-	-	-	49,558	1,828	-
4b.1.2.41	HE - Boron Recycle	-	462	27	78	403	263	-	256	1,489	1,489	-	-	3,460	794	-	-	-	191,531	8,970	-
4b.1.2.42	JE - Emergency Fuel Oil	-	63	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,260	-
4b.1.2.43	KA - Compressed Air and Instrument	-	270	-	-	-	-	-	40	310	-	-	310	-	-	-	-	-	-	6,089	-
4b.1.2.44	KB - Breathing Air	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,075	-
4b.1.2.45	KC - Fire Protection	-	410	-	-	-	-	-	61	471	-	-	471	-	-	-	-	-	-	9,256	-
4b.1.2.46	KC - Fire Protection RCA	-	351	12	88	693	-	-	206	1,350	1,350	-	-	5,944	-	-	-	-	241,384	6,383	-
4b.1.2.47	KD - Domestic Water	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	1,708	-
4b.1.2.48	KE - Fuel Hndlg & Strg Reactor Vssl Serv	-	18	2	13	103	-	-	22	157	157	-	-	882	-	-	-	-	35,813	332	-
4b.1.2.49	KJ - Standby Diesel Engine	-	332	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	6,749	-
4b.1.2.50	LA - Sanitary Drains	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	290	-
4b.1.2.51	LA - Sanitary Drains RCA	-	26	1	4	32	-	-	12	74	74	-	-	272	-	-	-	-	11,053	422	-
4b.1.2.52	LB - Roof Drains	-	56	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	1,276	-
4b.1.2.53	LB - Roof Drains RCA	-	146	4	32	249	-	-	79	511	511	-	-	2,139	-	-	-	-	86,858	2,694	-
4b.1.2.54	LC - Yard Drains	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	96	-
4b.1.2.55	LD - Chemical & Detergent Waste	-	108	2	12	93	-	-	43	258	258	-	-	797	-	-	-	-	32,369	2,139	-
4b.1.2.56	LF - Floor & Equipment Drains	-	1,357	88	219	776	1,189	-	795	4,424	4,424	-	-	6,660	3,627	-	-	-	501,387	26,164	-
4b.1.2.57	Main Access Facility	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	339	-
4b.1.2.58	RM - Process Sampling & Analysis	-	123	2	15	115	-	-	51	306	306	-	-	990	-	-	-	-	40,200	2,450	-
4b.1.2.59	Radwaste Bldg Non-System Specific	-	169	4	21	155	16	-	73	438	438	-	-	1,329	50	-	-	-	57,145	3,253	-
4b.1.2.60	Radwaste Bldg Non-System Specific RCA	-	1,176	26	188	1,478	-	-	547	3,415	3,415	-	-	12,684	-	-	-	-	515,103	21,919	-
4b.1.2.61	Reactor Bldg Non-System Specific	-	85	1	8	59	6	-	33	192	192	-	-	502	19	-	-	-	21,590	1,569	-
4b.1.2.62	Reactor Bldg Non-System Specific RCA	-	593	10	71	556	-	-	243	1,472	1,472	-	-	4,768	-	-	-	-	193,612	10,425	-

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4b.1.2.63	SBO Diesel Generator	-	177	-	-	-	-	-	27	204	-	-	204	-	-	-	-	-	-	3,610	-
4b.1.2.64	SJ - Nuclear Sampling	-	71	1	10	79	-	-	31	193	193	-	-	677	-	-	-	-	27,501	1,430	-
4b.1.2.65	ST - Sewage Treatment	-	107	-	-	-	-	-	16	124	-	-	124	-	-	-	-	-	-	2,316	-
4b.1.2.66	SZ - Service Air	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	1,892	-
4b.1.2.67	VA - I&C Shop HVAC	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	155	-
4b.1.2.68	VB - I&C Shop Computer Room HVAC	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	106	-
4b.1.2.69	VC - Health Physics Computer Room HVAC	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	208	-
4b.1.2.70	VJ - Shop Bldg Machine Shop Area Vent	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	57	-
4b.1.2.71	VL - Shop Building HVAC	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	101	-
4b.1.2.72	VS - Admin Bldg HVAC	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	262	-
4b.1.2.73	VT - Tech Support Building HVAC	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	87	-
4b.1.2.74	VW - Waste Water Treatment Ventilation	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	52	-
4b.1.2.75	WD - Domestic Water	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	870	-
4b.1.2.76	WM - Makeup Demineralizer	-	177	-	-	-	-	-	27	203	-	-	203	-	-	-	-	-	-	3,929	-
4b.1.2.77	WS - Plant Services Water	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	3,297	-
4b.1.2.78	WS - Plant Services Water RCA	-	39	4	27	214	-	-	46	331	331	-	-	1,838	-	-	-	-	74,625	782	-
4b.1.2.79	WT - Waste Water Treatment	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	769	-
4b.1.2.80	WZ - Radioactive Liquid Waste	-	43	4	9	29	55	-	31	170	170	-	-	247	167	-	-	-	20,647	783	-
4b.1.2.81	Yard Non-System Specific	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	603	-
4b.1.2	Totals	-	15,592	493	2,177	14,225	3,636	-	6,859	42,981	37,727	-	5,254	122,048	11,036	-	-	-	5,662,357	307,568	-
4b.1.3	Scaffolding in support of decommissioning	-	1,959	41	35	234	52	-	547	2,868	2,868	-	-	1,809	160	-	-	-	91,548	50,887	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,106	976	60	480	694	872	-	1,197	5,384	5,384	-	-	5,955	13,318	-	-	-	874,477	38,225	-
4b.1.4.2	Auxiliary	541	248	17	134	255	236	-	451	1,882	1,882	-	-	2,185	3,518	-	-	-	255,780	15,363	-
4b.1.4.3	Communication Corridor - Contaminated	12	3	0	3	2	5	-	9	34	34	-	-	17	76	-	-	-	4,296	306	-
4b.1.4.4	Fuel Building	770	744	12	65	315	89	-	651	2,646	2,646	-	-	2,705	984	-	-	-	158,200	27,457	-
4b.1.4.5	Hot Machine Shop	15	6	0	3	-	6	-	11	41	41	-	-	-	94	-	-	-	4,446	421	-
4b.1.4.6	RWST Foundation Decon	-	4	1	5	-	10	-	4	24	24	-	-	-	168	-	-	-	7,920	48	-
4b.1.4.7	Radwaste	288	110	8	67	98	122	-	228	921	921	-	-	844	1,857	-	-	-	122,469	7,815	-
4b.1.4.8	Radwaste Drum Storage	32	11	1	7	8	13	-	25	97	97	-	-	66	208	-	-	-	12,565	850	-
4b.1.4.9	Radwaste Storage Building	82	18	2	16	-	33	-	57	209	209	-	-	-	545	-	-	-	25,740	2,013	-
4b.1.4	Totals	2,846	2,121	101	780	1,372	1,385	-	2,632	11,237	11,237	-	-	11,773	20,770	-	-	-	1,465,893	92,498	-
4b.1.5	Prepare/submit License Termination Plan	-	-	-	-	-	-	536	80	616	616	-	-	-	-	-	-	-	-	-	4,096
4b.1.6	Receive NRC approval of termination plan									a											
4b.1	Subtotal Period 4b Activity Costs	3,473	19,747	901	3,199	15,831	7,118	536	11,021	61,825	56,572	-	5,254	135,630	38,216	-	-	-	7,616,876	452,675	4,096
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,688	507	2,195	2,195	-	-	-	-	-	-	-	-	-	12,480
4b.2.2	Operational Tools & Equipment	-	-	22	146	839	-	-	150	1,158	1,158	-	-	11,700	-	-	-	-	292,500	32	-
4b.2.3	Excavation of Underground Services	-	2,174	-	-	-	-	687	646	3,507	3,507	-	-	-	-	-	-	-	-	14,181	-
4b.2.4	License Termination ISFSI	-	65	221	1,895	-	4,096	3,190	2,367	11,834	11,834	-	-	-	23,409	-	-	-	2,971,239	8,091	11,017
4b.2.5	Remedial Action Surveys	-	-	-	-	-	-	2,515	754	3,269	3,269	-	-	-	-	-	-	-	-	55,808	-
4b.2	Subtotal Period 4b Additional Costs	-	2,238	244	2,041	839	4,096	8,080	4,424	21,963	21,963	-	-	11,700	23,409	-	-	-	3,263,739	78,112	23,497
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	13	-	25	42	-	98	-	40	218	218	-	-	-	204	-	-	-	12,265	40	-
4b.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b.3.3	Small tool allowance	-	379	-	-	-	-	-	57	436	436	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	135	132	775	173	-	193	1,408	1,408	-	-	6,000	529	-	-	-	303,608	147	-
4b.3.5	On-site survey and release of 44.30 tons clean metallic waste	-	-	-	-	-	-	64	6	70	70	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	13	379	160	174	775	271	64	296	2,133	2,133	-	-	6,000	733	-	-	-	315,873	187	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	2,054	-	-	-	-	-	-	513	2,567	2,567	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,673	167	1,841	1,841	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	2,779	278	3,056	3,056	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	6,640	-	-	-	-	-	1,660	8,299	8,299	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	6,118	-	-	-	-	-	918	7,036	7,036	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	136	107	-	379	-	125	747	747	-	-	-	6,610	-	-	-	132,195	216	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	4,973	746	5,718	5,718	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,464	146	1,611	1,611	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,338	201	1,539	1,539	-	-	-	-	-	-	-	-	-	-
4b.4.10	Corporate A&G Cost	-	-	-	-	-	-	1,022	153	1,175	1,175	-	-	-	-	-	-	-	-	-	-

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 4b Period-Dependent Costs (continued)																					
4b.4.11	Security Staff Cost	-	-	-	-	-	-	11,670	1,750	13,420	13,420	-	-	-	-	-	-	-	-	-	174,521
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	35,643	5,346	40,989	40,989	-	-	-	-	-	-	-	-	-	374,172
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	54,374	8,156	62,531	62,531	-	-	-	-	-	-	-	-	-	658,990
4b.4	Subtotal Period 4b Period-Dependent Costs	2,054	12,758	136	107	-	379	114,936	20,160	150,530	150,530	-	-	-	6,610	-	-	-	132,195	216	1,207,682
4b.0	TOTAL PERIOD 4b COST	5,540	35,123	1,441	5,521	17,445	11,864	123,616	35,901	236,451	231,197	-	5,254	153,330	68,968	-	-	-	11,328,680	531,189	1,235,275
PERIOD 4f - License Termination																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	164	49	213	213	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license									a											
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	164	49	213	213	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	8,039	2,412	10,450	10,450	-	-	-	-	-	-	-	-	153,690	6,240
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	8,039	2,412	10,450	10,450	-	-	-	-	-	-	-	-	153,690	6,240
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,398	210	1,608	1,608	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,398	210	1,608	1,608	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	802	80	883	883	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	1,329	-	-	-	-	-	332	1,661	1,661	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	7	6	-	21	-	7	41	41	-	-	-	361	-	-	-	7,229	12	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	383	57	440	440	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	522	52	574	574	-	-	-	-	-	-	-	-	-	-
4f.4.7	Corporate A&G Cost	-	-	-	-	-	-	119	18	137	137	-	-	-	-	-	-	-	-	-	-
4f.4.8	Security Staff Cost	-	-	-	-	-	-	1,392	209	1,601	1,601	-	-	-	-	-	-	-	-	-	19,353
4f.4.9	DOC Staff Cost	-	-	-	-	-	-	5,964	895	6,858	6,858	-	-	-	-	-	-	-	-	-	58,864
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	6,957	1,044	8,001	8,001	-	-	-	-	-	-	-	-	-	76,604
4f.4	Subtotal Period 4f Period-Dependent Costs	-	1,329	7	6	-	21	16,139	2,694	20,196	20,196	-	-	-	361	-	-	-	7,229	12	154,820
4f.0	TOTAL PERIOD 4f COST	-	1,329	7	6	-	21	25,740	5,364	32,467	32,467	-	-	-	361	-	-	-	7,229	153,702	161,060
PERIOD 4 TOTALS		5,785	80,907	18,354	13,895	31,594	55,744	210,415	89,317	506,011	496,325	-	9,686	280,370	133,269	501	406	2,217	21,731,270	1,044,712	2,023,357
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	3,121	-	-	-	-	-	468	3,589	-	-	3,589	-	-	-	-	-	-	27,724	-
5b.1.1.2	Access Vaults	-	11	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	59	-
5b.1.1.3	Administration	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	1,724	-
5b.1.1.4	Auxiliary	-	2,695	-	-	-	-	-	404	3,099	-	-	3,099	-	-	-	-	-	-	19,753	-
5b.1.1.5	Auxiliary Boiler	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	248	-
5b.1.1.6	Chemical Addition Structure	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	469	-
5b.1.1.7	Circ Water Pump Enclosure	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	164	-
5b.1.1.8	Circ Water Travel Screen Enclosure	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	160	-
5b.1.1.9	Circulating Water Discharge Structure	-	99	-	-	-	-	-	15	114	-	-	114	-	-	-	-	-	-	542	-
5b.1.1.10	Circulating Water Intake & Screenhouse	-	94	-	-	-	-	-	14	108	-	-	108	-	-	-	-	-	-	683	-
5b.1.1.11	Communication Corridor - Clean	-	970	-	-	-	-	-	145	1,115	-	-	1,115	-	-	-	-	-	-	8,280	-
5b.1.1.12	Communication Corridor - Contaminated	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	184	-
5b.1.1.13	Covered Walkways	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	242	-
5b.1.1.14	Diesel Generator	-	302	-	-	-	-	-	45	347	-	-	347	-	-	-	-	-	-	2,185	-
5b.1.1.15	E.S.W.S. Pumphouse	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	801	-
5b.1.1.16	ESWS Valve House	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	42	-
5b.1.1.17	FLEX Building NO. 1 & 2	-	429	-	-	-	-	-	64	493	-	-	493	-	-	-	-	-	-	2,880	-
5b.1.1.18	Fuel Building	-	1,108	-	-	-	-	-	166	1,275	-	-	1,275	-	-	-	-	-	-	7,874	-
5b.1.1.19	GOB - Administration Building	-	235	-	-	-	-	-	35	270	-	-	270	-	-	-	-	-	-	2,962	-
5b.1.1.20	Hot Machine Shop	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	243	-
5b.1.1.21	M.M.O. Building	-	315	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	2,389	-
5b.1.1.22	Main Access Facility	-	500	-	-	-	-	-	75	575	-	-	575	-	-	-	-	-	-	4,717	-
5b.1.1.23	Material Center West	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	1,379	-

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Demolition of Remaining Site Buildings (continued)																					
5b.1.1.24	Misc Structures and Additions	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	910	-
5b.1.1.25	Miscellaneous Site Foundations	-	225	-	-	-	-	-	34	259	-	-	259	-	-	-	-	-	-	1,242	-
5b.1.1.26	Miscellaneous Site Structures	-	1,799	-	-	-	-	-	270	2,069	-	-	2,069	-	-	-	-	-	-	13,693	-
5b.1.1.27	New Covered Walkway	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	79	-
5b.1.1.28	Oil Separator and Waste Tank	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	8	-
5b.1.1.29	Radwaste	-	1,091	-	-	-	-	-	164	1,254	-	-	1,254	-	-	-	-	-	-	8,111	-
5b.1.1.30	Radwaste Drum Storage	-	149	-	-	-	-	-	22	171	-	-	171	-	-	-	-	-	-	1,449	-
5b.1.1.31	Radwaste Storage Building	-	82	-	-	-	-	-	12	94	-	-	94	-	-	-	-	-	-	1,028	-
5b.1.1.32	SBO Diesel Generator	-	360	-	-	-	-	-	54	414	-	-	414	-	-	-	-	-	-	3,079	-
5b.1.1.33	Security Main Gate North	-	107	-	-	-	-	-	16	124	-	-	124	-	-	-	-	-	-	1,123	-
5b.1.1.34	Security Additions	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	405	-
5b.1.1.35	Security/Guardhouse	-	35	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	342	-
5b.1.1.36	Site Diesel Generator	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	18	-
5b.1.1.37	Support Complex	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	389	-
5b.1.1.38	Turbine Building	-	4,242	-	-	-	-	-	636	4,878	-	-	4,878	-	-	-	-	-	-	47,075	-
5b.1.1.39	Turbine Pedestal	-	527	-	-	-	-	-	79	607	-	-	607	-	-	-	-	-	-	2,934	-
5b.1.1.40	Waste Water Treatment	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	172	-
5b.1.1.41	Water Treatment Building North (Z110)	-	65	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	608	-
5b.1.1	Totals	-	19,264	-	-	-	-	-	2,890	22,154	-	-	22,154	-	-	-	-	-	-	168,368	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	1,163	-	-	-	-	-	174	1,337	-	-	1,337	-	-	-	-	-	-	5,660	-
5b.1.3	Grade & landscape site	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	512	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	204	31	235	235	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	20,535	-	-	-	-	204	3,111	23,849	235	-	23,615	-	-	-	-	-	-	174,540	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	1,168	-	-	-	-	19	178	1,365	-	-	1,365	-	-	-	-	-	-	4,700	-
5b.2.2	Circulating Water Intake Cofferdam	-	341	-	-	-	-	-	51	392	-	-	392	-	-	-	-	-	-	2,584	-
5b.2.3	Construction Debris	-	-	-	-	-	-	2,250	338	2,588	-	-	2,588	-	-	-	-	-	-	-	-
5b.2.4	Site Restoration ISFSI	-	1,292	-	-	-	-	612	286	2,189	-	-	2,189	-	-	-	-	-	-	5,501	160
5b.2.5	E.S.W.S. Cofferdam	-	447	-	-	-	-	-	67	514	-	-	514	-	-	-	-	-	-	3,552	-
5b.2.6	Firing Range Closure	-	-	-	-	-	-	848	127	975	-	-	975	-	-	-	-	-	-	-	-
5b.2	Subtotal Period 5b Additional Costs	-	3,247	-	-	-	-	3,729	1,046	8,023	-	-	8,023	-	-	-	-	-	-	16,337	160
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	176	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	176	-	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,540	154	1,694	-	-	1,694	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	4,738	-	-	-	-	-	711	5,448	-	-	5,448	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	367	55	422	-	-	422	-	-	-	-	-	-	-	-
5b.4.5	Corporate A&G Cost	-	-	-	-	-	-	94	14	108	-	-	108	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	2,672	401	3,072	-	-	3,072	-	-	-	-	-	-	-	37,132
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	10,920	1,638	12,559	-	-	12,559	-	-	-	-	-	-	-	105,208
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,327	799	6,126	-	-	6,126	-	-	-	-	-	-	-	60,340
5b.4	Subtotal Period 5b Period-Dependent Costs	-	4,738	-	-	-	-	20,920	3,772	29,429	-	-	29,429	-	-	-	-	-	-	-	202,680
5b.0	TOTAL PERIOD 5b COST	-	28,696	-	-	-	-	24,853	7,955	61,504	235	-	61,269	-	-	-	-	-	-	190,877	204,400
PERIOD 5 TOTALS		-	28,696	-	-	-	-	24,853	7,955	61,504	235	-	61,269	-	-	-	-	-	-	190,877	204,400
TOTAL COST TO DECOMMISSION		13,553	126,098	18,943	14,557	31,652	57,302	1,043,157	219,450	1,524,712	1,133,530	318,571	72,611	292,159	143,761	501	406	2,217	22,169,740	1,336,091	9,317,438

Table D
Wolf Creek Generating Station
SAFSTOR Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			

TOTAL COST TO DECOMMISSION WITH 16.81% CONTINGENCY:	**$1,524,712**	**thousands of 2023 dollars**	
TOTAL NRC LICENSE TERMINATION COST IS 74.34% OR:	**$1,133,530**	**thousands of 2023 dollars**	
SPENT FUEL MANAGEMENT COST IS 20.89% OR:	**$318,571**	**thousands of 2023 dollars**	
NON-NUCLEAR DEMOLITION COST IS 4.76% OR:	**$72,611**	**thousands of 2023 dollars**	
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**144,668**	**Cubic Feet**	
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**2,217**	**Cubic Feet**	
TOTAL SCRAP METAL REMOVED:	**70,087**	**Tons**	
TOTAL CRAFT LABOR REQUIREMENTS:	**1,336,091**	**Man-hours**	

End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

APPENDIX E

ISFSI DECOMMISSIONING COST SUMMARY

Table E
Wolf Creek Generating Station
ISFSI Decommissioning Cost Estimate
(thousands of 2023 dollars)

Activity Description	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	243	243	-	-	1,072
Decontamination (activated disposition)	65	221	1,895	4,096	-	6,277	23,409	378	-
License Termination (radiological surveys)	-	-	-	-	1,223	1,223	-	7,713	-
Subtotal	**65**	**221**	**1,895**	**4,096**	**1,466**	**7,743**	**23,409**	**8,091**	**1,072**
Supporting Costs									
NRC and NRC Contractor Fees and Costs	-	-	-	-	523	523	-	-	1,153
Insurance	-	-	-	-	140	140	-	-	-
Property taxes	-	-	-	-	343	343	-	-	-
Plant energy budget	-	-	-	-	16	16	-	-	-
Corporate A&G Cost	-	-	-	-	6	6	-	-	-
Security Staff Cost	-	-	-	-	356	356	-	-	4,999
Utility Staff Cost	-	-	-	-	339	339	-	-	3,792
Subtotal	-	-	-	-	**1,724**	**1,724**	-	-	**9,945**
Total (w/o contingency)	**65**	**221**	**1,895**	**4,096**	**3,190**	**9,467**	**23,409**	**8,091**	**11,017**
Total (w/25% contingency)	**81**	**277**	**2,369**	**5,121**	**3,987**	**11,834**			

Note: Columns/Rows may not add due to rounding.

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

APPENDIX F

COST SENSITIVITY OF SHORT-TERM

POOL-BASED SPENT FUEL STORAGE

APPENDIX F
COST SENSITIVITY OF SHORT-TERM POOL-BASED SPENT FUEL STORAGE

Introduction

As discussed in the last Decommissioning Cost Analysis (DCA) for Wolf Creek, issued in August 2020, developments in the area of spent nuclear fuel disposal suggest a possibility that the federal government may not have removed all of Wolf Creek's spent nuclear fuel and high-level radioactive waste (hereafter, simply "spent fuel") from the station by the time the plant is ready for decommissioning. As such, the scenario where the spent fuel remains on site for an extended period following decommissioning of the power block has become the most likely to occur. This is the base case for the 2023 DCA. The alternative case in the 2023 DCA for Wolf Creek includes five years wet storage and complete transfer to DOE by the end of 2050, five and one-half years after final shutdown of Wolf Creek in 2045. While there is still much uncertainty in this area, the probability that the 2023 DCA alternative scenario occurs has become unlikely.

For continuity and comparison with the 2020 estimate, the five years wet storage with complete transfer to DOE is presented in this Appendix, updated to 2023 dollars. There still is much uncertainty in this area. Because the assumptions used in this Appendix F analysis are speculative at this point, the hypothetical cost effects shown here have not been included in the overall updated cost estimate in this report.

Completion of the decommissioning process (release of the entire site for unrestricted use) is highly dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program is currently based upon the premise that spent fuel allocations would be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order in which it was discharged from the reactor (i.e., establishing a national "queue"). Even if spent fuel could be transferred to a federal facility for interim storage (in the absence of a permanent disposal facility), the nature of the queue would be expected to result in a long backlog of spent fuel at each site. Under the current system, as can be seen at sites where reactors have been decommissioned, the owner(s) can anticipate several decades of continuing, on-site storage of the spent fuel before the transfer could be expected to be complete.

Base Analyses

The estimate described in this Appendix is based in general upon 1) a 2031 start date for DOE initiating transfer of commercial spent fuel to a federal facility, and 2) a 2038 start date for the transfer of spent fuel from the Wolf Creek site based on an "oldest fuel first" priority, and the DOE achieving an annual rate of transfer (3,000 metric tons of uranium per year) as reflected in DOE's latest Acceptance Priority Ranking and Annual Capacity Report.[1]

The assumed 2031 DOE start date is nominally based on the last position stated by the DOE. Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program had originally assumed that spent fuel allocations would be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.[2] However, the Blue Ribbon Commission, in its final report, noted that: "[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. …. The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first."

Under this scenario, once Wolf Creek permanently ceases operation, DOE would expedite the removal of spent fuel from the site. The cost estimates described in the main body of this report assumed that:

- The spent fuel pool would contain 814 fuel assemblies at shutdown, including the final core discharge
- Shipment of fuel from the Wolf Creek site would give priority to the spent fuel stored in the pool, followed by shipment from the ISFSI.

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1 "Acceptance Priority Ranking and Annual Capacity Report," U.S. DOE, Office of Civilian Radioactive Waste Management, DOE/RW-0567, July 2004

2 U.S. Code of Federal Regulations, Title 10, Part 961.11, Article IV – Responsibilities of the Parties, B. DOE Responsibilities, 5.(a) … DOE shall issue an annual acceptance priority ranking for receipt of SNF and/or HLW at the DOE repository. This priority ranking shall be based on the age of SNF and/or HLW as calculated from the date of discharge of such materials from the civilian nuclear power reactor. The oldest fuel or waste will have the highest priority for acceptance …"

- The spent fuel pool would be emptied within the first four years following plant shutdown. This would allow decommissioning to be completed and the site released for unrestricted use within a relatively short time.
- The DOE is assumed to use its Transport, Aging and Disposal canister to empty the wet storage pool.[3] The canisters would be provided to WCNOC at no cost, however, Wolf Creek staff/or contractors would load, seal and transfer the multi-purpose canisters into a DOE-provided transport cask. It is estimated that post-shutdown shipment via TADs to DOE will consist 262 of fuel assemblies.
- All remaining spent fuel in the fuel pool not shipped directly to the DOE will be transferred to the onsite ISFSI. It is estimated that this will consist of 552 fuel assemblies.
- Following shutdown and decommissioning of the spent fuel pool, periodic transfers of spent fuel canisters from the ISFSI to the DOE occur. Between two and three 37-assembly canisters will ship yearly to the DOE from the ISFSI. This occurs over the period of 2050 to 2078.
- Greater-than-Class C (GTCC)[4] material generated during decommissioning will be packaged into the equivalent of dry fuel storage canisters and placed in the ISFSI, awaiting eventual transfer to the DOE. After the last of the spent fuel canisters are transferred to the DOE, the GTCC canisters will then be transferred as well, in the final year of ISFSI operations.
- The ISFSI would then be decommissioned.

Alternative Analysis

The assumed 2031 DOE start date is nominally based on the last position stated by the DOE. More importantly, the estimates assume that the DOE would give priority to fuel at shutdown sites,[5] i.e., it assumed that Congress would "(1)…direct the Department to take spent nuclear fuel from decommissioned commercial nuclear power reactors as soon as possible; (2) to establish an expedited siting process; and (3) to authorize the Department to construct and operate the facility under its regulatory

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3 "Transport, Aging and Disposal Canister System Performance Specification," U.S. DOE, Civilian Radioactive Waste Management System, DOC ID: WMO-TADCS-000001, Rev.1, March 2008

4 U.S. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"

5 "Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy," https://www.energy.gov/ne/articles/blue-ribbon-commission-americas-nuclear-future-report-secretary-energy, p. 42, January 2012

authority, or, if the facility were to be constructed and operated under a U.S. Nuclear Regulatory Commission license, to provide for an expedited siting and licensing process."[6]

It is generally necessary that spent fuel be cooled and stored for a minimum period at the generating site prior to transfer. As such, the NRC requires that licensees establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE, pursuant to 10 CFR Part 50.54(bb). [7] The post-shutdown costs incurred to satisfy this requirement include the isolation and continued operation of the spent fuel pool and the ISFSI during the five and one-half years following the cessation of plant operations.

At shutdown, the spent fuel pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core. Over the following five and one-half years the assemblies are packaged into multipurpose canisters for transfer to the DOE.

Interim storage of the fuel, until the DOE has completed the transfer, will be in the wet storage pool located in the fuel building (as well as on the ISFSI). The pool will be isolated, allowing WCNOC to proceed with decommissioning (or safe-storage preparations) in the shortest time possible. Note however that this five and one-half year period is longer than the base case scenario, incurring an additional one and one-half years of such period-dependent costs as staffing, security, insurance, and taxes among others.

This alternative analysis examines the cost impact of the spent fuel management model described previously for the caretaking and removal of the spent fuel generated during plant operations.[8] The alternative analysis scenario includes the following assumptions:

- DOE pickup of spent fuel would begin in 2038, and would end five and one-half years after final shutdown of Wolf Creek in 2045, including assemblies already present in the on-site ISFSI prior to shutdown.
- WCNOC would operate the ISFSI and manage the spent fuel until such time that the DOE could complete the transfer to an off-site facility

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6 "Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel from Decommissioned Nuclear Power Reactor Sites" DOE/RW-0596, December 2008

7 U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"

8 This analysis does not consider that the cost incurred would most likely be reimbursable as a result of DOE's breach of contract due to it non-performance

- The DOE would accept the multi-purpose canister without the need for repackaging the assemblies, i.e., the DOE transport cask could accommodate the multi-purpose canister without modification
- WCNOC staff or WCNOC contracted staff would transfer the multi- purpose canister into the DOE-provided transport cask
- The concrete storage overpack and ISFSI pad would be decommissioned with the balance of the nuclear island and the NRC license terminated for the entire site at the end of Period 2 in 2052.

The impact of these assumptions, as compared to the Base Analysis, is summarized as follows.

	Base Case	Alternative
Spent fuel pool inventory at shutdown (assemblies)	814	814
ISFSI inventory at shutdown (assemblies)	1,887	1,887
Spent fuel transferred to the DOE during plant ops	663	663
Spent fuel transferred to the DOE from pool during decommissioning (assemblies)	262	903
Spent fuel transferred to the ISFSI for interim storage within 4 years after shutdown (assemblies)	552	0
Number of additional dry-storage modules needed to support decommissioning (excluding GTCC)	15	0
Transfer of Spent Fuel to DOE Complete (year)	2078	2050

The schedule of expenditure in the following table delineates the cost contributors by year of expenditures as well as escalation category (e.g., labor, materials, and waste disposal). Costs are reported in 2023 dollars and are not inflated, escalated, or discounted over the period of expenditure.

The cost for disposal of GTCC material is realized as the material is generated during reactor vessel segmentation in this alternative analysis (Table F, during years 2046-2048).

While this analysis attempts to capture the cost for short-term pool-based spent fuel management at the Wolf Creek site, under the scenario outlined above, it is WCNOC's position that the DOE has a contractual obligation to accept Wolf Creek's fuel earlier than the projections set out above consistent with its contract commitments. No assumption made in this analysis should be interpreted to be inconsistent with this claim.

TABLE F
DECON ALTERNATIVE WITH SHORT-TERM POOL-BASED SPENT FUEL MANAGEMENT SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2023 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2045	63,175	2,157	2,303	35	11,093	78,764
2046	89,122	27,351	4,211	17,166	34,066	171,917
2047	90,728	44,557	2,698	42,788	26,238	207,009
2048	80,163	25,095	2,340	22,705	16,446	146,749
2049	73,426	12,623	2,130	11,412	10,918	110,509
2050	68,745	22,722	1,825	13,870	11,753	118,915
2051	40,715	5,890	776	7,151	6,644	61,176
2052	25,077	12,910	325	5	3,214	41,531
2053	14,421	9,126	178	0	2,076	25,801
Total	545,572	162,431	16,786	115,132	122,448	962,370

Note: Columns may not add due to rounding

APPENDIX G

U.S. DECOMMISSIONING EXPERIENCE TO DATE

PROVIDED AS KANSAS CORPORATION COMMISSION

REQUESTED INFORMATION UNDER DOCKET 15-WCNE-093-GIE

Decommissioning

Kansas Corporation Commission has requested additional background information on decommissioning efforts to date for U.S. nuclear plants including (i) decommissioning methods employed; (ii) the reason for decommissioning if performed prior to the end of plant expectancy, and (iii) a comparison of actual costs of decommissioning to previous cost estimates for decommissioned plants. The following analysis is based on publicly available information.

1. Decommissioning Methods Employed

As discussed in more detail in Sections 1 and 2 of this document, when a power company decides to permanently close a nuclear power plant, the facility must be decommissioned by safely removing it from service and reducing residual radioactivity to a level that permits release of the property and termination of the operating license. Licensees may choose from three decommissioning strategies: DECON, SAFSTOR, or ENTOMB.

- DECON (immediate dismantling) - soon after the nuclear facility closes, equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits release of the property and termination of the NRC license (assuming that the spent fuel has been removed from the site).
- SAFSTOR (safe-storage and deferred dismantling) - a nuclear facility is maintained and monitored in a condition that allows the radioactivity to decay; afterwards, the plant is dismantled and the property decontaminated.
- ENTOMB - radioactive contaminants are permanently encased on site in structurally sound material such as concrete. The facility is maintained and monitored until the radioactivity decays to a level permitting restricted release of the property. (In a draft regulatory basis document published in March 2017 in support of rulemaking that would amend NRC regulations concerning nuclear plant decommissioning, the NRC staff proposes removing any discussion of the ENTOMB option from existing guidance documents since the method is not deemed practically feasible.)

The licensee may also choose to adopt a combination of the first two choices in which some portions of the facility are dismantled or decontaminated while other parts of the facility are left in SAFSTOR. The decision may be based on factors besides radioactive decay, such as availability of waste disposal sites. Decommissioning must be completed within 60 years of the plant ceasing operations. A time beyond that would be considered only when necessary to protect public health and safety in accordance with NRC regulations.

As described in Table G, the decommissioning methods employed by the 25 commercial nuclear power reactors that have shut down since 1989 have varied: 11 have employed DECON, 10 have employed SAFSTOR and 4 have employed combined SAFSTOR/DECON. Moreover, not all DECON sites have terminated their licenses. License termination is contingent upon the removal of the spent fuel from the site. For example, the plants listed in Table G that elected the DECON option still have fuel on site (excluding Shoreham) in a licensed Independent Spent Fuel Storage Installation or ISFSI. While the decommissioning of these plants is considered complete, only those portions of the site, exclusive of the ISFSI, have been released for alternative and unrestricted use.

Table G
Decommissioning Alternative(s) Selected
for Commercial Nuclear Power Reactors
(since 1989) [1]

Unit	Location	MWt	Shut Down	Decommissioning Alternative Selected
Rancho Seco	Herald, CA	2,772	7-Jun-89	SAFSTOR/DECON [2]
Shoreham	Wading River, NY	2,436	28-Jun-89	DECON
Fort St. Vrain	Platteville, CO	842	18-Aug-89	DECON
Yankee-Rowe	Rowe, MA	600	1-Oct-91	DECON
Trojan	Rainier, OR	3,411	9-Nov-92	DECON
San Onofre 1	San Clemente, CA	1,347	30-Nov-92	SAFSTOR/DECON [3]
Zion 2	Zion, Il	3,250	19-Sep-96	SAFSTOR/DECON [4]
Connecticut Yankee	Haddam Neck, CT	1,825	5-Dec-96	DECON
Maine Yankee	Wiscasset, ME	2,700	6-Dec-96	DECON
Zion 1	Zion, Il	3,250	21-Feb-97	SAFSTOR/DECON [4]
Big Rock Point	Charlevoix, MI	240	29-Aug-97	DECON
Millstone 1	Waterford, CT	2,011	21-Jul-98	SAFSTOR
Crystal River 3	Crystal River, FL	2,609	20-Feb-13	SAFSTOR
Kewaunee	Carlton, WI	1,772	7-May-13	SAFSTOR
San Onofre 2	San Clemente, CA	3,438	12-Jun-13	DECON
San Onofre 3	San Clemente, CA	3,438	12-Jun-13	DECON
Vermont Yankee	Vernon, VT	1,912	29-Dec-14	SAFSTOR [5]
Fort Calhoun	Fort Calhoun, NE	1,500	24-Oct-16	SAFSTOR
Oyster Creek	Forked River, NJ	1,930	17-Sep-18	SAFSTOR
Pilgrim	Plymouth, MA	2,028	31-May-19	SAFSTOR [6]
Three Mile Island 1	Middletown, PA	2,568	20-Sep-19	SAFSTOR
Indian Point 2	Buchanan, NY	3,216	30-April-20	DECON [7]
Duane Arnold	Palo, IA	1,912	10-Aug-20	SAFSTOR
Indian Point 3	Buchanan, NY	3,216	30-Apr-21	DECON
Palisades	Covert, MI	2,565	31-May-22	SAFSTOR

Table G Notes:

1. Source: Table G data and information on reactors shut down since 1989 extracted from Appendix C of NRC's Information Digest 2022-2023, NUREG-1350, Volume 34, February 2023. Reactors shut down prior to 1989 include TMI-2 (accident) in 1979 and a number of smaller facilities constructed in the late 1950s and 1960s, under the Atomic Energy Commission, to demonstrate the peacetime use of nuclear power. These include the GE VBWR, GE EVESR, Pathfinder, Savannah, N.S. (ship), Saxton, Fermi-1, Indian Point- 1, Peach Bottom-1, Humboldt Bay-3, Dresden-1, and La Crosse reactors. All of the facilities were initially placed into safe-storage (SAFSTOR). The reactors at Pathfinder, Saxton, Fermi-1, Humboldt Bay-3, and La Crosse were subsequently decommissioned or are currently in the process of being decommissioned.
2. The Sacramento Municipal Utility District initially placed the reactor into safe-storage (until 2008). However, on January 9, 1997, the Board of Directors approved an "incremental decommissioning" project for Rancho Seco accelerating the decommissioning timeline.
3. Southern California Edison initially placed the reactor into safe-storage, planning to decommission Unit 1 along with Units 2 and 3, at the end of their licenses (2013). In 1998, the company notified the NRC that it would commence decommissioning operations in June 1999.
4. Commonwealth Edison initially placed the two reactors into safe-storage. On August 23, 2010, the Nuclear Regulatory Commission approved the transfer of Exelon's (ComEd's parent company) license to ZionSolutions for "prompt" decommissioning.
5. Entergy initially placed the reactor into safe-storage after the December 2014 shutdown. On February 9, 2016, NorthStar Group Services filed an application (along with Entergy) with the NRC to acquire the license of the shutdown plant for "prompt" decommissioning.
6. Entergy initially placed the reactor into safe-storage after the May 2019 shutdown. In August 2019, the NRC approved the transfer of the license of the shutdown plant from Entergy to Comprehensive Decommissioning International for "prompt" decommissioning.
7. Entergy made the decision to modify its license renewal efforts for Indian Point Units 2 and 3. The license extension agreements were granted approval for expiration in 2024 and 2025 for the respective units. The company also decided to cease operation of Unit 2 in 2020 and Unit 3 in 2021.

2. Reason for Premature Decommissioning

The reactors identified in Table G all ceased operations prior to the expiration of their operating licenses (premature shutdown). As such, the opportunity to preplan the decommissioning was limited and often hampered by a shortfall in the funds available for decommissioning (since rate collections also disrupted).

The majority of the owners of reactors in Table G terminated operations due to economics, although poor operating histories and the prospect of expensive plant modification and repairs, and competition from less expensive generation also contributed to the decisions.

Rancho Seco Nuclear Generating Station

Reactor Type: Type: Pressurized Water Reactor
Operating License Issued: 16 August 1974
Shutdown: 07 June 1989

The plant operated commercially from April 1975 to June 1989, but at a lifetime capacity under 50%. A number of incidents at the plant precipitated an NRC mandated re-start program that would have involved a significant effort and cost. In accordance with the results of a public referendum on June 6, 1989, the Sacramento Municipal Utility District decided to permanently shut down the plant on June 7, 1989.

Shoreham Nuclear Power Station

Reactor Type: Boiling Water Reactor
Operating License Issued: 21 April 1989
Shutdown: 28 June 1989

The plant was completed in 1984 and received federal permission for low-power (5 percent) testing. The owner, Long Island Lighting Company (LILCO), faced considerable public opposition after the 1979 Three Mile Island accident, with Suffolk County legislators claiming that the county could not be safely evacuated in the event of an accident. Governor Mario Cuomo ordered state officials not to approve any LILCO-sponsored evacuation plan - effectively preventing the plant from operating at full capacity. On May 19, 1989, LILCO agreed not to operate the plant in a deal with the state under which most of the $6 billion construction cost was passed on to Long Island ratepayers.

Fort St. Vrain Nuclear Generating Station

Reactor Type: Gas-Cooled Reactor
License Issued: 21 December 1973
Shutdown: 18 August 1989

The helium cooled, graphite moderated reactor went into commercial operation on July 1, 1979 and operated for a little more than 10 years. On August 18, 1989, while the plant was shut down to repair a stuck control rod pair, numerous cracks were discovered in several steam generator main steam ring headers. The required repairs were determined by the Public Service Company of Colorado Board of Directors to be too extensive to justify continued operation. On August 29, 1989, the Board decided to termination operations.

Yankee Nuclear Power Station

Reactor Type: Pressurized Water Reactor
Operating License Issued: 24 December 1963
Shutdown: 01 October 1991

The small, 185 megawatt nuclear reactor operated from 1961-1992 when it was permanently shut-down on February 26, 1992 by the Board of Directors of the Yankee Atomic Electric Company (Yankee Atomic). Although economics was cited in the decision by the board, it was the perceived viability of the plant's reactor vessel and related questions raised by the NRC's staff that likely contributed to the permanent shutdown. The inability to accurately quantify the actual level of embrittlement in the Yankee Rowe reactor vessel cast doubt on the vessel's ability to survive a thermal shock when cold water is injected during an accident condition. Potential fixes (e.g., replacing or annealing the vessel in situ) were both untried and unproven options and very costly.

Trojan Nuclear Plant

Reactor Type: Pressurized Water Reactor
Operating License Issued: 21 November 1975
Shutdown: 09 November 1992

In announcing the permanent cessation of operations in early 1993, the Directors of Portland General Electric (PGE), cited the cost of replacing the plant's steam generators (estimated then at $200 million) as the basis for the decision. The generators had experienced significant tube degradation and failures, beginning shortly after the plant went on line. (In a 1997 Technical Issues summary, the NRC noted that steam generator tube degradation was responsible for multiple

steam generator tube rupture events across the industry, extensive repairs, forced outages, replacement of the generators at 15 plants and contributed to the decision to shut down two nuclear power plants: San Onofre, Unit 1, and Trojan.)

There was also significant environmental opposition to the operation of the Trojan plant, with the owners surviving multiple state referendums that attempted to close the plant.

San Onofre Nuclear Generating Station, Unit 1

Reactor Type: Pressurized Water Reactor
Operating License Issued: 27 March 1967
Shutdown: 31 November 1992

Unit 1 entered commercial operation in January of 1968. It had a capacity factor of approximately 73 percent over its first twelve years of operation, but half that value over the succeeding thirteen years (through 1992). The change in performance was due to several extended outages for major plant repairs (e.g., steam generator tube sleeving and redesign of the reactor vessel thermal shield supports) and upgrades (e.g., in seismic design, fire protection, and from post- Three Mile Island (TMI) requirements). Southern California Edison's (SCE) attempt to convert its Provisional Operating License to a Full-Term Operating License was hindered by its high costs and the opposition of the Ratepayer Advocate to recover such costs in rates, arguing declining performance and possible need to replace the steam generators. Ultimately, a settlement was reached to permanently shut down the unit and recoup sunk costs.

Zion Nuclear Power Station

Reactor Type: Pressurized Water Reactor
Operating License Issued: 19 October 1973 / 14 November 1973
Shutdown: 21 February 1997 / 19 September 1996

The 1998 press release announcing the permanent shutdown of the Zion reactors after nearly 25 years of operations, cited economics as the rationale. "A thorough analysis of the projected costs to produce power at the station and the expected price of electricity in a deregulated market led us to one conclusion: Zion Station will not be able to produce competitively priced power in a deregulated marketplace over the remaining useful life of the plant. The analysis was based on three factors: the cost of operating and supporting the plant, the amount of power it was expected to generate and the projected price of electricity in a deregulated market. "

The station had had a troubled past and was on the NRC's "watch list" prior to its announcement to permanent cease operations (along with two other nuclear stations operated by Commonwealth Edison). The decision to shut down followed an earlier announcement not to replace the plants steam generators. The shutdown decision was viewed by investors as an opportunity for the owner/operator to reallocate its resources to its other troubled facilities.

Connecticut Yankee Atomic Power Station

Reactor Type: Pressurized Water Reactor
Operating License Issued: 30 June 1967 (Provisional)
Operating License Issued: 27 December 1974 (Full Term)
Shutdown: 05 December 1996

The Connecticut Yankee Atomic Power Company Board of Directors voted to permanently close the Haddam Neck plant in December 1996. Press releases by the company identified three factors: the age of the plant, its relatively small size, and its high operating cost compared to alternative energy sources (e.g., oil and natural gas). The plant also had a troubled past, having been shut down since the previous July for safety reasons (as reported by the NRC in its 1997 notice of violation and referenced inspections in 1995 and 1996).

Maine Yankee Atomic Power Station

Reactor Type: Pressurized Water Reactor
Operating License Issued: 29 June 1973
Shutdown: 06 December 1996

While the plant's operating history had been one of successful low-cost, reliable generation, the two years preceding its closure were marked by unscheduled outages, increased regulatory scrutiny, and considerable media attention. As a result of extensive outages in 1995 and 1996, and growing concerns about steam generator reliability, the plant owners conducted detailed economic analyses on the viability of continuing plant operation, versus permanently closing the facility. The Maine Yankee Atomic Power Company Board voted on August 6, 1997 to decommission the plant. David Flanagan, chair of the Maine Yankee Atomic Power Company Board, stated that "an economic analysis of operations, rising expenses for plant upgrades and the projections for stable power costs fueled the decision by Maine Yankee's eight owners to explore permanent shutdown."

Big Rock Point Nuclear Plant

Reactor Type: Boiling Water Reactor
Operating License Issued: 01 May 1964
Shutdown: 29 August 1997

Consumers Energy announced on June 11, 1997, that the nation's longest running and oldest operating unit would be permanently shut down on August 30, 1997. The announcement cited the plant's relatively small generating capacity (67 megawatts), high cost of operation in an increasingly competitive environment, improvements to the plant that would be needed to meet future regulatory requirements and the limited time left on its operating license (3 years).

Millstone Power Station, Unit 1

Reactor Type: Boiling Water Reactor
Operating License Issued: 31 October 1970 (Provisional)
Operation License Issued: 31 October 1986 (Full Term)
Shutdown: 21 July 1998

On July 17, 1998, Northeast Utility decided to permanently shut down the Unit 1 reactor (it had been shut down for refueling in November of 1995 and not restarted). The company concluded that the cost to restore the plant to full operations would only bring a slight economic benefit to its customers. Once recognized as one of the best performing boiling water reactors, Unit 1, along with the adjacent two units at the site were on the NRC's watch list at the time the decision was made to close and the company had been assessed the largest fine ever imposed by the NRC (citing more than 50 violations from October 24, 1995 to December 31, 1996). Restart of any of the three units was contingent, at that time, on approval from an independent consultant and a vote from the regulatory agency.

Crystal River Nuclear Plant, Unit 3

Reactor Type: Pressurized Water Reactor
Operating License Issued: 03 December 1976
Shutdown: 20 February 2013

In 2009, Progress Energy replaced the unit's two steam generators during a scheduled maintenance and refueling outage. In the process, engineers discovered a delamination, or separation of concrete, within the reactor building that surrounds the reactor vessel. Although the initial damage was successfully

repaired, additional delamination was discovered in two different areas of the reactor building in 2011.

An independent review commissioned in 2012 confirmed that repairing the containment building was technically feasible but included significant risks that could raise the cost of the repair and extend the repair schedule significantly. On February 5, 2013, Duke Energy (having acquired Progress Energy in 2012) announced its decision to retire the nuclear unit instead of pursuing repair to the plant's containment building.

Kewaunee Power Station

Reactor Type: Pressurized Water Reactor
Operating License Issued: 21 December 1973
Shutdown: 07 May 2013

On October 22, 2012, Dominion Resource Inc. announced that they would shut down the nuclear unit in mid-2013 after they were unable to find a buyer for the plant. The announcement cited the low price of natural gas, (e.g., from record shale production), expiring purchase power agreements, the plant's age, and Dominion's inability to grow its nuclear fleet in the Midwest (which would have provided some economics in operations).

San Onofre Nuclear Generating Station, Units 2 and 3

Reactor Type: Pressurized Water Reactor
Operating License Issued: 16 February 1982 / 15 November 1982
Shutdown: 13 June 2013

On June 7, 2013, Southern California Edison (SCE) decided to permanently retire Units 2 and 3 at its San Onofre Nuclear Generating Station (San Onofre). The Chairman and CEO of Edison International cited continuing uncertainty about when or if the units might return to service as the deciding factor. In particular, ongoing regulatory and administrative processes and appeals were expected to cause extended delays. Both units had been shut down since January 2012, Unit 2 for refueling and Unit 3 after small leaks were detected in the newly replaced steam generators (the steam generators had been replaced in Unit 2 in 2009 and in Unit 3 in 2010). A subsequent investigation concluded that the steam generators, manufactured by Mitsubishi Heavy Industries, had design flaws.

Vermont Yankee Nuclear Power Station

Reactor Type: Boiling Water Reactor
Operating License Issued: 21 March 1972
Shutdown: 29 December 2014

On August 27, 2013, Entergy Corporation announced that Vermont Yankee would cease operations in the fourth quarter of 2014 for economic reasons. Reasons cited included; sustained, low natural gas prices and wholesale energy prices, a high cost structure for the single unit plant (since 2002, the company invested more than $400 million in the safe and reliable operation of the facility), the financial impact of cumulative regulation, and artificially low energy and capacity prices in the region that did not provide adequate compensation to merchant nuclear plants for the fuel diversity benefits they provide.

Fort Calhoun Station

Reactor Type: PRESSURIZED WATER REACTOR
Operating License Issued: 09 August 1973
Shutdown: 24 October 2016

On June 16, 2016, the Omaha Public Power District's Board of Directors determined that it was in the best financial interest of the District and its customer-owners to retire Fort Calhoun Station by the end of 2016. Market conditions were cited as a primary factor in the decision, including historically low natural gas prices and a reduced demand for electricity. Fort Calhoun was also the smallest rated commercial unit in the United States at the time, making it difficult to absorb the higher, fixed production costs.

Oyster Creek Nuclear Generating Station

Reactor Type: Boiling Water Reactor
Operating License Issued: 09 April 1969
Shutdown: 17 September 2018

In January 2010, the New Jersey Department of Environmental Protection (NJDEP) revised rules on water use such that once-through cooling is no longer allowed for large industrial facilities which included Oyster Creek Station. Oyster Creek entered negotiations with the State of New Jersey throughout 2010 and announced in December of 2010 that the facility would be closed by year end 2019 to preclude installation of cooling towers as mandated by the new NJDEP regulations and standards. Due to growing costs and external economic factors (mainly driven by the expiring/expired price agreements due to the announced

closure), in February 2018, Exelon announced an accelerated plant closure date of October 2018. The unit was permanently shut down on September 17, 2018.

Pilgrim Nuclear Power Station

Reactor Type: Boiling Water Reactor
Operating License Issued: 08 June 1972
Shutdown: 31 May 2019

In 2015, Entergy announced a strategy to reduce risk and shrink its footprint of Entergy Wholesale Commodities (EWC) merchant nuclear power business. On October 10, 2015, Entergy announced it would close Pilgrim Nuclear Power Station no later than June 1, 2019. The company cited poor market conditions, reduced revenues, and increased operational costs as reason for the closure. Specifically noted were the low current and forecast wholesale energy prices, design flaws in the wholesale energy market, and increased costs associated with addressing the NRC placing the unit in regulatory Column 4. On August 23, 2019, the NRC approved the license transfer of Pilgrim to Holtec.

Three Mile Island Nuclear Station Unit 1

Reactor Type: PRESSURIZED WATER REACTOR
Operating License Issued: 19 April 1974
Shutdown: 20 September 2019

In May 2017, Exelon Generation announced that without Pennsylvania state policy reforms, Three Mile Island Nuclear Station (TMI) Unit 1 would close in September 2019. Exelon representatives cited the reason for closing to be economic challenges and inability to compete with other state-subsidized energy sources as Pennsylvania energy policies do not currently recognize nuclear as clean energy. On May 8, 2019 the decision was made final to shutdown TMI Unit 1 by September 30, 2019. In early 2022, the owner of TMI Unit 1 was changed to Constellation Energy Company by an indirect transfer.

Indian Point Energy Center Unit 2

Reactor Type: Pressurized Water Reactor
Operating License Issued: 28 September 1973
Shutdown: 30 April 2020

On January 9, 2017 Entergy announced it would cease operating both operating units at Indian Point Energy Center in 2020 (Unit 2) and 2021 (Unit 3). The early shutdown of the Units as part of a settlement under which the State of New York

has agreed to drop legal challenges and support renewal of the operating licenses for both Indian Point Units. The company noted the early shutdown is in alignment with their EWC footprint reduction and cited sustained low current and projected wholesale energy prices which reduced revenues, as well as increased operational costs. The company additionally noted the $200 million spent in license renewal and associated legal costs with no foreseeable resolution as a reason for the early closure. On November 23, 2020 the NRC approved the transfer of the facility operating licenses for all units and the general license for the ISFSI from Entergy to Holtec.

Duane Arnold Energy Center

Reactor Type: Boiling Water Reactor
Operating License Issued: 22 June 1970
Shutdown: 10 August 2020

NextEra Energy had expected to permanently cease operations at Duane Arnold Energy Center (DAEC) in 2025 following the expiration of the plant's power purchase agreement (PPA) with Alliant Energy. However, in 2018, NextEra and Alliant reached a settlement to shorten the term of the PPA by five years, moving the expected shutdown date to October 2020. In August 2020, DAEC suffered damages to non-safety related portions of the plant, including the cooling towers, due to a derecho, a land-based hurricane. Consequently, DAEC permanently shut down on August 10, 2020.

Indian Point Energy Center Unit 3

Reactor Type: Pressurized Water Reactor
Operating License Issued: 12 December 1975
Shutdown: 20 April 2021

In 2015, Entergy announced a strategy to reduce risk and shrink its footprint of Entergy Wholesale Commodities (EWC) merchant nuclear power business. On January 9, 2017 Entergy announced it would cease operation of both operating units at Indian Point Energy Center in 2020 (Unit 2) and 2021 (Unit 3). The early shutdown of the Units is part of a settlement under which the State of New York has agreed to drop legal challenges and support renewal of the operating licenses for both Indian Point Units. The company noted the early shutdown is in alignment with their EWC footprint reduction and cited sustained low current and projected wholesale energy prices which reduced revenues, as well as increased operational costs. The company additionally noted the $200 million spent in license renewal and associated legal costs with no foreseeable resolution as a reason for the early closure. On November 23, 2020 the NRC approved the transfer of the facility

operating licenses for all units and the general license for the ISFSI from Entergy to Holtec.

Palisades Nuclear Plant

Reactor Type: Pressurized Water Reactor
Operating License Issued: 24-February 1971 (Provisional)
Operating License Issued: 21 February 1991 (Full-Term)
Shutdown: 31 May 2022

In 2015, Entergy announced a strategy to reduce risk and shrink its footprint of Entergy Wholesale Commodities (EWC) merchant nuclear power business. In 2017 it was decided the Palisades Nuclear Plant would shut down on May 31, 2022 at the expiration of the plant's power purchase agreement with Consumers Energy, marking the completion of Entergy's strategy. On May 20, 2022 the plant was removed from service early due to the performance of a control rod drive seal. On June 28, 2022 the NRC approved the transfer of the facility operating license from Entergy to Holtec.

3. Actual v. Projected Cost of Decommissioning

In general, the financial information available on the decommissioning projects that have been completed is limited, beyond that provided in periodic NRC-required filings on financial assurance. Decommissioning contractors believe that the release of detailed cost information can cause irreparable harm to their competitive position in bidding future work and plant owners generally release only what is required by regulators. As such, cost data in the public record is typically presented at a very high level or heavily redacted.

The NRC's regulations require licensees to demonstrate financial assurance throughout the operating life of the reactor, including biennial comparisons to the NRC's threshold funding amounts. In addition, licensees are required to file several, site-specific estimates as the plant nears its end of operating life and following the permanent cessation of operations:

- a preliminary decommissioning cost estimate at or about 5 years prior to the projected end of operations (10 CFR 50.75(f)(2)) which includes an up-to-date assessment of the major factors that could affect the cost to decommission;
- an estimate of expected costs for the activities being proposed in the Post-Shutdown Decommissioning Activities Report (PSDAR), submitted prior to or within 2 years following permanent cessation of operations;

- a site-specific decommissioning cost estimate within 2 years following permanent cessation of operations. This requirement may be satisfied by including a site-specific estimate as part of the PSDAR. (10 CFR 50.82(a)(8)(iii)); and
- an updated site-specific estimate of remaining decommissioning costs as part of a License Termination Plan (LTP) at least 2 years before termination of the license (10 CFR 50.82(a)(9)(ii)(F)).

The following chronologies were extracted from the licensee's NRC filings and referenced documents, as available, for projects that have been recently completed or are nearing completion. Decommissioning, for purposes of this discussion, is tied to the completion of the radiological remediation work at the site since, in most instances, the site will remain under a NRC license until the spent fuel can be removed by the Department of Energy (DOE), i.e., there is still an ongoing caretaking cost being reported at most sites for the operation of an ISFSI.

The chronologies reflect a degree of volatility in the early decommissioning cost estimates (prepared in the late 1980s and early 1990s). This can be attributed to issues such as:

- Premature shutdown adding costs with longer and less efficient transitions from plant operations to decommissioning (since little or no pre-planning had been done).
- Minimal regulatory guidance as the NRC had not anticipated the wave of early plant closures. Decommissioning planning was also more cumbersome in the pre-PSDAR era and regulatory relief was on a case-by-case basis.
- ISFSIs were required to off-load storage pools and reduce plant operating costs (earlier decommissioning estimates had assumed that the spent fuel would be removed by the DOE in accordance with the standard contract).
- The decommissioning trust funds were not fully funded due to the abbreviated operating periods – limiting options and favoring deferred action or temporary actions while funding was secured.
- Low-level radioactive waste disposal costs were in flux with the failed attempts to create state compacts and develop new disposal sites.

In 1996, in an effort to streamline the regulatory process for those plants that had prematurely ceased operations, the NRC published revisions to its general requirements for decommissioning nuclear power plants. The rule was intended to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The 1996 rule, along with

other NRC staff guidance (for example, Regulatory Guide 1.184 issued in July 2000), provided a more predictable path to license termination and added an additional degree of certainty to later decommissioning estimates.

Rancho Seco Nuclear Generating Station

On May 20, 1991, the District submitted a proposed Decommissioning Plan to the NRC. The plan outlined a scenario that placed the plant into "Hardened SAFSTOR". The spent fuel would be moved into dry storage and the plant placed into a safe, dormant condition with a small site maintenance staff until 2008 (original license expiration) when a Decommissioning Operations Contractor would be brought in to complete decommissioning. The timeline allowed for the Decommissioning Trust Fund to be fully funded before dismantlement began. The NRC issued a decommissioning order and approved the Rancho Seco decommissioning funding plan on March 20, 1995.

Shortly thereafter, the District engaged TLG Services, Inc. (TLG) to develop alternatives to the SAFSTOR scenario (due to delays and increased cost of the dry

fuel storage project), including using the on-site staff for limited decontamination and dismantling activities. In January of 1997, Board of Directors (the Board) approved a trial project involving the limited physical dismantlement of the facility. In 1999, the Board approved expansion of the Incremental Decommissioning Project to include all activities necessary for license termination.

The cost estimate prepared by TLG in 1999 represented both the shift to a plant area-based approach and the schedule change associated with accelerating the decommissioning timeline. With the commencement of active decommissioning came the requirement to perform annual updates to the cost estimate. In 2000, TLG prepared an update to the 1999 area-based cost estimate. By that time, relatively long-term contracts were in place to provide labor, technical staff, transportation, radwaste packaging materials, radwaste processing, and radwaste disposal to support the decommissioning process. TLG used this actual information when preparing the 2000 cost estimate.

1999 TLG Estimate (license termination) TLG Document No. S11-1337-003, Rev. 0	$420.178 million ($1999)
2000 TLG Estimate (license termination) TLG Document No. S11-1360-002, Rev. 0	$495.416 million ($2000)
Update of Site-Specific Decommissioning Costs Rancho Seco License Termination Plan, Rev. 2 October 2014	$534.185 million ($2005)

2011 Decommissioning Cost Estimate 18 June 2012 Letter to NRC (DPG 12-305)	$517.1 million ($2011)[1]
Report on Decommissioning Funding Status 14 March 2016 Letter to NRC (DPG 16-0620	$518.34 million[2]

Rancho Seco Notes:

1. $487.2 spent to date for site remediation (site is released except for that area around the Interim Onsite Storage Building). Future costs for remaining activities are estimated at $29.9 million for a total 2011 Decommissioning Cost Estimate of $517.1 million. Remaining activities include: the transfer of Greater Than Class "C" (GTCC) Radioactive Waste to the DOE in 2027; disposal of Class B & C low- level radioactive waste (LLRW) in 2016 and oversight of the LLRW until disposal; and license termination activities following disposal of the LLRW.
2. Remaining activities include: the transfer of the used nuclear fuel and GTCC, license termination activities for the area licensed under Part 50 begun in 2015 and scheduled to be completed in 2016; and, license termination activities for the Part 72 licensed facility following removal of the material from the ISFSI.

Yankee Nuclear Power Station

The Decommissioning Plan, which was submitted in December 1993 by the Yankee Atomic, involved placing the plant into SAFSTOR until a low-level waste disposal facility was available (expected in 2000), when dismantlement (DECON) would begin. The Decommissioning Plan included a cost study for operating the facility through a safe storage period, decommissioning the facility, restoring the site, and storing spent fuel until its transfer to the DOE. In October 1994, Yankee Atomic completed a revised cost study to assist the NRC in its review of the Decommissioning Plan and to fulfill a commitment to Federal Energy Regulatory Commission (FERC). This 1994 cost study was also based on the assumption that dismantlement activities would not begin until a low-level radioactive waste disposal site became available.

In June 1995, the State of South Carolina re-opened the low-level waste facility in Barnwell, South Carolina, to radioactive waste generators throughout the United States. In response, Yankee Atomic updated the cost estimate to reflect several significant changes in parameters affecting decommissioning costs. This study, called the 1995 Cost Study, was filed with FERC in August 1995. In this study, the 1994 Cost Study was adjusted for differences in decommissioning timing, waste disposal costs, and one year of escalation. The 1995 Cost Study estimate of "to-go" costs remaining as of January 1995 was $303.2 million. In addition, as part of the final December 1995 FERC settlement, Yankee Atomic was allowed to collect another $3.2 million in the decommissioning trust fund to adjust for adjudicatory delays during re-approval of the Decommissioning Plan, bringing the total January 1995 "to-go" cost to $306.4 million (1995 dollars).

As required by the FERC settlement, an updated cost estimate was filed in December 1999.

Yankee Atomic submitted a new decommissioning cost estimate to FERC in April 2003 seeking additional revenue. The 2003 estimate superseded the 1999 "to go" cost estimate. It was reported that, as of January 1, 2003, the remaining cost to complete the NRC required decommissioning activities was estimated at $121.1 million, stated in 2003 dollars.

Decommissioning was completed and the plant's operating license was amended (for continued ISFSI operations) in August 2007.

1995 Cost Study ("to go" costs)	$306.4 million (1995 dollars)
1999 Cost Estimate	$453.0 million (1999 dollars)[3]
Yankee Atomic LTP, Rev. 1 YAEC to NRC, BYR 2004-133 19 November 2004	$636.4 million ($2003)[4]

Yankee-Rowe Notes:

3. The total includes $207.1 million spent to date, $147.7 million in projected expenditures for dismantling and $98.3 million in spent fuel storage costs.
4. The total includes $347.9 million spent to date, $288.5 million in projected expenditures (2003 - 2022) in 2003 dollars. The $288.5 million included the remaining cost to complete the required decommissioning activities ($121.1 million), contingency, long term spent fuel storage costs through 2022, and site restoration.

Trojan Nuclear Plant

Portland General Electric (PGE) reported that the decommissioning cost estimate in the initial Decommissioning Plan was based largely on a site-specific cost estimate performed for PGE by TLG Services, Inc. in May 1994.

In a March 8, 2005 meeting before the Oregon Public Utility Commission, PGE reported that radiological decommissioning was expected to be complete by June 2005 and that their overall radiological decommissioning cost performance was approximately 8% under budget.

Decommissioning was completed and the plant's operating license terminated (ISFSI operations continue under a separate license) in May of 2005.

TLG Document No. P15-25-002, Rev. 1 18 August 1994 (excludes the cost of the large component removal project, i.e., disposition of the reactor vessel, steam generators, pressurizer)	$289.8 million ($1993)
PGE Decommissioning Plan and LTP, Rev. 16 27 March 2003	$429.7 million ($1997)[5]

PGE Decommissioning Plan and LTP, Rev. 21 31 March 2005	$421.9 million ($1997)[6]

Trojan Notes:

5. Total cost includes radiological, non-radiological, dry spent fuel management and financing costs.
6. Total cost includes $211.7 million for radiological decommissioning activities, $40.2 million for non-radiological, $169.9 million for dry spent fuel management and $16 thousand for financing costs.

Zion Nuclear Power Station

Commonwealth Edison Company (now Exelon Generation Company) submitted a PSDAR on February 14, 2000, following the permanent cessation of operations of the two nuclear units at the Zion Nuclear Power Station in 1998.

On January 25, 2008, Exelon and Zion Solutions, LLC (a wholly-owned subsidiary of EnergySolutions, LLC) submitted an Application for License Transfers to the NRC requesting that the NRC consent to the transfer of the plant to ZionSolutions. On March 18, 2008, ZionSolutions submitted an amended PSDAR stating their intention to accelerate the decommissioning schedule if the application for license transfers was approved.

The decommissioning cost estimate presented in the ZionSolutions PSDAR was based upon the plant commodities developed for an earlier TLG cost estimate completed in 2006 for Exelon.

Commonwealth Edison, PSDAR 14 February 2000	$904.3 million ($1996)
2006 TLG Estimate TLG Document No. E16-1555-004, Rev. 0	$1.043 billion ($2006)
ZionSolutions, Amended PSDAR 18 March 2008	$978.0 million ($2007)[7]
Report on Decommissioning Funding Status 30 March 2016 Letter to NRC (ZS-2015-0044)	$677.2 million ($2014)
Report on Decommissioning Funding Status 29 March 2016 Letter to NRC (ZS-2016-0036)	$667.3 million ($2015)[8]

Zion Notes:

7. The $978.0 million in 2007 dollars includes provisions for storage of spent fuel and GTCC wastes on the Zion site until 2018, as well as site restoration costs for all areas except the ISFSI.

8. Includes $486.8 million spent to date (through December 31, 2015), $158.9 million estimated costs to complete decommissioning and $21.6 million for managing irradiated fuel at the site until 2020 when the site is scheduled to transition back to Exelon.

Maine Yankee Atomic Power Station

Maine Yankee submitted its site-specific decommissioning cost estimate to the NRC on November 3, 1998. The accompanying report, "Decommissioning Cost Analysis for the Maine Yankee Atomic Power Station," prepared by TLG and dated October 1997, provided the detailed analysis of the projected costs for the decommissioning activities (radiological decontamination, spent fuel management and site remediation/restoration).

The License Termination Plan (Rev. 2), submitted by Maine Yankee and dated October 15, 2002, escalated the TLG 1997 cost to 2001 dollars for comparison with the costs spent to date.

On March 30, 2005, Maine Yankee provided a decommissioning funding status report to the NRC (MN-05-014). In that submittal, the company reported that the plant "is nearing completion of decommissioning" and that "as of December 31, 2004, $554 million has been expended for all decommissioning costs, of which $405 million has been estimated as the allocation of actual expenditures for decommissioning activities, as defined by the NRC expenditures for decommissioning activities, as defined by the NRC in 10 CFR 50.2."

Decommissioning was completed and the plant's operating license was amended (for continued ISFSI operations) in September of 2005.

TLG Document No. M01-1258-002, Rev. 1 28 October 1997	$508.2 million ($1997)[9]
License Termination Plan, Rev. 3 15 October 2002	$589.3 million ($2001)[10]
NRC Decommissioning Funding Status Report 30 March 2005	$554 million (YOE)[11]

Maine Yankee Notes:

9. Total cost for radiological decontamination, spent fuel management and site remediation/restoration.
10. $508 million escalated to $2001.
11. Total cost as of 31 December 2004 including $405 million of decommissioning costs, excluding Department of Energy contract settlement credits.

Big Rock Point

Consumers Energy filed a revision to their PSDAR on March 26, 1998. The decommissioning costs reported in that document were based on a detailed, site-specific cost estimate that was prepared by TLG. Pursuant to State of Michigan requirements to prepare and file decommissioning cost estimate updates with the Michigan Public Service Commission (MPSC) at three-year intervals, an update was prepared by TLG in 2000 and filed in March 2001 as a follow-up to a site-specific decommissioning cost estimate filed with the MPSC in March 1998.

The 2000 estimate, updated with actual costs incurred through 2002 and the latest forecast costs, served as the cost basis for the License Termination Plan submitted in 2003. The $400.6 million estimated in 2001 was revised downward by Consumers Energy to $382.4 million in year 2000 constant dollars. The $18.2 million reduction was the result of a reduction in contingency dollars from $45.0 million to $13.0 million and an increase in projected spent fuel management costs from $50.9 million to $64.7 million.

Consumers Power noted in its LTP submittal that "entering the third year since the 2000 estimate was prepared, actual project cost performance has been on target and is expected to trend unchanged.

On March 31 2005, Consumers Power filed an update to the PSDAR (Rev. 4). The update included discussion on a revised cost estimate that had been presented to the MPSC in March 2004. The estimated cost to decommission the plant was based on the 2003 estimate study prepared by TLG. The estimate (in year of expenditure dollars) was $439.4 million.

Decommissioning was completed and the plant's operating license was amended (for continued ISFSI operations) in January of 2007.

1998 TLG Estimate $293.9 million ($1997)
TLG Document No. C07-1267-004, Rev. 0
26 March 1998

2001 TLG Estimate ($2000)[12] TLG Document No. C07-1388-003, Rev. 0 01 March 2001	$400.6	million
BRP License Termination Plan, Rev. 0 ($2000)[13] 01 April 2003	$382.4	million
2004 TLG Estimate ($2003) TLG Document No. C07-1479-001, Rev. 0 22 March 2004	$430.8	million
BRP PSDAR, Rev. 4 31 March 2005	$439.4	million (YOE)
BRP License Termination Plan, Rev. 2 (YOE)[14] 27 September 2005	$439.4	million

Big Rock Point Notes:

12. $323.0 million Radiological Decommissioning, $50.9 million for Spent Fuel Management and $26.7 million for Site Restoration.

13. $291.0 million Radiological Decommissioning, $64.7 million for Spent Fuel Management and $26.7 million for Site Restoration.

14. $333.9 million of radiological decommissioning costs, $73.6 million of spent nuclear fuel storage costs, $30.3 million of site restoration and $1.6 million of post 9-11 incremental security costs. Consumers Energy has concluded that, based upon information currently available, that the estimate was adequate to complete the remaining decommissioning activities for the plant.

ATTACHMENT 3

Escalation Rate and
Estimated Cost at Decommissioning

BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

DIRECT TESTIMONY OF

BRETT L. LOVELL

ON BEHALF OF
EVERGY METRO, INC.
EVERGY KANSAS SOUTH, INC.
AND
KANSAS ELECTRIC POWER COOPERATIVE, INC.

IN THE MATTER OF THE 2023
WOLF CREEK TRIENNIAL DECOMMISSIONING
FINANCING PLAN.

DOCKET NO. 23-WCNE-___-GIE

Q: Please state your name and business address.

A: My name is Brett L. Lovell. My business address is 1200 Main Street. Kansas City, Mo, 64105.

Q: By whom and in what capacity are you employed?

A: I am employed by Evergy Metro, Inc. ("EM") and Evergy Kansas South, Inc. ("EKS") as Manager, Corporate Treasury.

Q: What are your responsibilities?

A: My responsibilities include cash management and corporate finance functions of Evergy and its related companies.

Q: Please describe your education, experience and employment history.

A: I joined Evergy in January 2021 after relocating from California after a thirty-five year professional career in commercial banking, commercial real estate finance, and corporate treasury. Eight-plus years of corporate treasury and finance in aerospace and defense has dovetailed directly into the past three years with this utility company and industry. I am a graduate of California State University Sacramento with a degree in Business Finance with minor in Economics.

Q: Have you previously testified in a proceeding at the State Corporation Commission for the State of Kansas ("KCC" or "Commission") or before any other utility regulatory agency?

A: No. This is my first time providing testimony.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to recommend an escalation rate that would be applied to the estimated cost of decommissioning the Wolf Creek Nuclear Generating Station ("Wolf Creek") stated in 2023 dollars, as projected by TLG Services, Inc. ("TLG") of Bridgewater, Connecticut in a report titled "Decommissioning Cost Analysis for the Wolf Creek Generating Station" dated August, 2023. The decommissioning cost estimates provided by TLG in the study are reported in the year of projected expenditure but the values are provided in 2023 dollars. Costs are not inflated, escalated, or discounted over the periods of performance. Therefore the annual inflation rate I am recommending escalates the 2023 decommissioning cost estimate prepared by TLG to the equivalent cost in the future year of expenditure. Decommissioning expenditures are assumed to begin in 2045, when the Wolf Creek operating license will expire.

Q: On whose behalf are you presenting this testimony?

A: I am presenting this testimony on behalf of the three co-owners of Wolf Creek, including EM, EKS, and Kansas Electric Power Cooperative, Inc. ("KEPCo").

I. RECOMMENDED RATE OF INFLATION

Q: What is the current dollar decommissioning cost estimate for Wolf Creek and what is the basis for the cost estimate?

A: The current dollar decommissioning cost estimate for Wolf Creek is based on a study performed by TLG dated August 2023. TLG is a recognized industry leader in nuclear decommissioning cost analysis. The decommissioning cost estimate varies depending upon the decommissioning alternative selected. The estimated cost for the DECON alternative is $1,171,363,000 in 2023 dollars. Plus, the cost of decommissioning the Independent Spent Fuel Storage Installation of $11,834,000. The TLG study is included as part of the Wolf Creek Decommissioning Finance Plan filed in compliance with the Commission's Order in Docket No. 15-WCNE-093-GIE.

Q: What is the assumed timing of the future decommissioning costs?

A: Wolf Creek's operating license expires on March 11, 2045. The 2023 TLG Wolf Creek decommissioning study includes schedules of decommissioning costs beginning in 2045 and continuing through 2079 for the DECON alternative.

Q: What is the decommissioning cost escalation rate that you are recommending?

A: I am recommending a separate escalation rate be applied to each of the five main cost elements that comprise TLG's cost estimate: (i) labor cost, (ii) equipment & material cost, (iii) energy cost, (iv) burial cost, and (v) other cost. The specific escalation rates are: (i) 3.2% for labor cost, (ii) 2.0% for equipment & material cost, (iii) 2.8% for the

electricity component of energy costs and 1.7% for the fuel cost component, (iv) 5.15% for burial cost, and (v) 2.5% for other costs.

Q: Does this methodology for determining an escalation rate for Wolf Creek decommissioning costs differ from the methodology proposed in the Wolf Creek Decommissioning Cost Study case in 2020?

A: No.

Q: What was the basis for your recommended cost escalation rate for each cost element identified by TLG in their decommissioning study?

A: There are no indices that specifically measure inflation in nuclear decommissioning costs. I developed an estimate for each component of the plant decommissioning cost (except nuclear waste burial costs) utilizing long range forecasts for various indices published by Moody's Analytics. Moody's Analytics is a well-known and respected source of economic forecasts, and its website at www.economy.com contains projections through 2050 for the indices used in my calculation. For Labor Cost, I used the Employment Cost Index ("ECI") for Total Compensation-All Civilian and All Workers. For the electricity component of the Energy Cost, I used the Producer Price Index ("PPI") for Electric Power-Total. For the fuel oil component of the Energy Cost, I used the PPI for No. 2 Fuel Oil. For the Equipment & Materials Cost, I used the PPI for All Commodities. For the Other Cost, I used the Consumer Price Index ("CPI")-All Commodities.

Q: How did you estimate the burial cost escalation rate?

A: The Moody's Analytics forecast does not include a projection of burial costs. However, the NRC, in their periodically revised *NUREG-1307* report, provides escalation factors for the waste burial/disposition cost element. *NUREG-1307* contains indices for

historical burial costs at the Washington and South Carolina low-level waste storage sites. While neither of these storage sites currently accept low-level waste from generators that are not located in the Northwest, Rocky Mountain, Atlantic or Texas Compact states, I used the historical burial cost indices for these sites as a reasonable proxy for the burial cost escalation rate for Wolf Creek's low-level waste to be deposited at a still to-be-determined storage site.

Q: Please describe the results of your analysis for the cost escalation formula.

A: For all of the cost components except burial cost, I calculated the compound annual growth of the Moody's Analytics projections for years 2023 through 2044 as shown in attached Schedule BLL-1 and used these figures as the escalation rate for each of the individual components of the estimated decommissioning cost.. For the burial component, I calculated the geometric means for years 1995 through 2022 (PWR/Compact/Direct Disposal) for the Washington and South Carolina sites, respectively, as shown in attached Schedule BLL-2 and averaged the geometric means for the two sites. The results for the various components of the formula are:

Labor Cost	3.2%
Equipment & Material Cost	2.0%
Energy Cost:	
Electricity	2.8%
Fuel Oil	1.7%
Burial Cost	5.15%
Other Costs	2.5%

Q: Does that conclude your testimony?

A: Yes.

BEFORE THE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the 2023 Wolf Creek Triennial Decommissioning Financing Plan.	)))	Docket No. 23-WCNE-____-GIE

AFFIDAVIT OF BRETT LOVELL

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

Brett Lovell, being first duly sworn on his oath, states:

1. My name is Brett Lovell. I work in Kansas City, Missouri, and I am employed by Evergy Metro, Inc. ("EM") as Manager, Corporate Secretary and Treasury Management.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of the three co-owners of Wolf Creek consisting of six (6) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Brett Lovell

Subscribed and sworn before me this 1st day of September 2023.

Notary Public

My commission expires: 4/26/2025

ANTHONY R. WESTENKIRCHNER
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 26, 2025
PLATTE COUNTY
COMMISSION #17279952

Schedule: BLL-1 **Moody's Escalation Rates**

Source: Moody's Analytics (www.economy.com) *(see Al Bass for information - he has a subscription)*

Mnemonic:	**FXPPIFU7302.IUSA**	**FXPPIFU4.IUSA**	**FECICCQ.IUSA**	**FCPIU.IUSA**	**FXPPI000000.IUSA**
Description:	Baseline Scenario (June 2023): PPI: No. 2 Fuel Oil, (Index 1982=100, NSA)	Baseline Scenario (June 2023): PPI: Electric Power - Total, (Index 1982=100, NSA)	Baseline Scenario (June 2023): ECI: Total Compensation - All Civilian - All Workers, (Index Dec2005=100, SA)	Baseline Scenario (June 2023): CPI: Urban Consumer - All Items, (Index 1982-84=100, SA)	Baseline Scenario (June 2023): PPI: All Commodities, (Index 1982=100, NSA)
Source:	U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted	U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted	U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted	U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted	U.S. Bureau of Labor Statistics (BLS); Moody's Analytics Forecasted
Native Frequency:	QUARTERLY	QUARTERLY	QUARTERLY	QUARTERLY	QUARTERLY
Geography:	United States	United States	United States	United States	United States
Begin Date:	03/31/1975	03/31/1958	03/31/1982	03/31/1947	03/31/1913
Last Updated:	06/05/2023	06/05/2023	06/05/2023	06/05/2023	06/05/2023
Historical End Date:	03/31/23	03/31/23	03/31/23	03/31/23	03/31/23
2023Q1	284.70	261.48	157.40	301.33	258.62
2023Q2	240.46	260.41	158.90	303.19	255.97
2023Q3	240.48	271.76	160.36	305.21	257.19
2023Q4	261.03	260.62	161.73	307.65	260.10
2024Q1	262.40	261.29	163.04	309.72	262.20
2024Q2	260.88	267.75	164.31	311.57	262.86
2024Q3	249.26	278.36	165.54	313.25	263.32
2024Q4	242.59	267.30	166.71	314.83	263.59
2025Q1	228.39	268.63	167.88	316.39	263.62
2025Q2	224.42	275.39	169.04	318.01	263.56
2025Q3	213.72	285.70	170.19	319.59	263.75
2025Q4	212.94	273.54	171.34	321.12	264.42
2026Q1	206.36	274.34	172.49	322.72	265.15
2026Q2	209.90	281.03	173.66	324.33	265.94
2026Q3	206.36	291.62	174.83	325.96	266.87
2026Q4	212.30	279.47	176.01	327.57	268.41
2027Q1	209.86	280.66	177.20	329.20	269.65
2027Q2	215.12	287.91	178.39	330.80	270.64
2027Q3	211.69	299.12	179.60	332.44	271.62
2027Q4	218.12	286.90	180.81	334.13	273.18
2028Q1	215.23	288.27	182.03	335.86	274.49
2028Q2	221.59	295.79	183.27	337.62	275.66
2028Q3	218.54	307.38	184.51	339.40	276.82
2028Q4	224.69	294.87	185.76	341.19	278.41
2029Q1	221.01	296.35	187.03	343.00	279.66
2029Q2	226.69	304.13	188.29	344.81	280.73
2029Q3	223.01	316.03	189.57	346.62	281.80
2029Q4	229.13	303.11	190.86	348.46	283.40
2030Q1	225.56	304.52	192.16	350.32	284.72
2030Q2	231.72	312.39	193.47	352.19	285.88
2030Q3	228.19	324.49	194.79	354.08	287.06
2030Q4	234.44	311.13	196.13	355.96	288.68
2031Q1	230.47	312.51	197.47	357.86	289.98
2031Q2	236.30	320.54	198.84	359.76	291.09
2031Q3	232.34	332.92	200.21	361.67	292.21
2031Q4	238.54	319.15	201.60	363.57	293.84
2032Q1	234.61	320.52	203.01	365.48	295.19
2032Q2	240.84	328.74	204.42	367.41	296.36
2032Q3	237.05	341.45	205.85	369.36	297.56
2032Q4	243.48	327.30	207.31	371.34	299.27
2033Q1	239.51	328.72	208.77	373.32	300.67
2033Q2	245.78	337.20	210.26	375.33	301.89
2033Q3	241.95	350.31	211.75	377.36	303.15
2033Q4	248.86	335.82	213.27	379.42	304.94
2034Q1	245.28	337.36	214.79	381.51	306.47
2034Q2	252.37	346.15	216.34	383.64	307.84
2034Q3	248.93	359.71	217.90	385.80	309.23
2034Q4	256.19	344.87	219.47	387.98	311.11
2035Q1	252.40	346.51	221.07	390.17	312.69
2035Q2	259.33	355.60	222.68	392.40	314.06
2035Q3	255.54	369.60	224.32	394.65	315.44
2035Q4	262.84	354.32	225.97	396.92	317.33
2036Q1	258.94	356.01	227.65	399.21	318.93
2036Q2	266.17	365.37	229.34	401.52	320.34
2036Q3	262.47	379.78	231.05	403.85	321.81
2036Q4	270.31	364.03	232.78	406.20	323.82

2038Q1	276.31	375.93	241.66	418.32	332.60
2038Q2	284.59	385.90	243.48	420.80	334.20
2038Q3	281.18	401.23	245.32	423.30	335.83
2038Q4	290.06	384.57	247.18	425.83	337.99
2039Q1	286.72	386.46	249.05	428.39	339.88
2039Q2	295.71	396.75	250.94	430.98	341.59
2039Q3	292.44	412.58	252.84	433.60	343.36
2039Q4	301.99	395.48	254.76	436.25	345.62
2040Q1	298.67	397.51	256.70	438.93	347.60
2040Q2	308.20	408.19	258.64	441.62	349.39
2040Q3	305.07	424.57	260.61	444.33	351.23
2040Q4	315.40	407.01	262.59	447.05	353.60
2041Q1	312.45	409.14	264.59	449.81	355.68
2041Q2	323.08	420.18	266.61	452.59	357.59
2041Q3	320.34	437.10	268.64	455.40	359.55
2041Q4	331.60	419.04	270.68	458.22	362.01
2042Q1	328.84	421.27	272.75	461.05	364.17
2042Q2	340.26	432.70	274.82	463.92	366.16
2042Q3	337.62	450.19	276.92	466.81	368.21
2042Q4	349.71	431.59	279.04	469.71	370.73
2043Q1	346.78	433.92	281.18	472.64	372.91
2043Q2	358.78	445.74	283.34	475.59	374.89
2043Q3	355.84	463.79	285.52	478.56	376.90
2043Q4	368.34	444.61	287.72	481.56	379.35
2044Q1	365.06	447.00	289.94	484.58	381.50
2044Q2	377.49	459.17	292.18	487.61	383.49
2044Q3	373.95	477.77	294.44	490.66	385.46
2044Q4	386.67	457.97	296.72	493.73	387.84

2023-2044	**1.7%**	**2.8%**	**3.2%**	**2.5%**	**2.0%**
	PPI: No. 2 Fuel Oil	**PPI: Electric Power - Total**	**ECI: Total Compensation - All Civilian - All Workers**	**CPI: Urban Consumer - All Items**	**PPI: All Commodities**

Schedule: BLL-2 **1995-2018 Burial Escalation**

	Bx Values for Washington Site (U.S. Ecology)				Bx Values for South Carolina Site (Barnwell) Atlantic Compact				Bx Values for Generators Located in the Unaffiliated States and those Located in Compact Affiliated States having no Disposal Facility			
	Compact Affiliated Disposal Facility Only		Combination of Compact Affiliated and Non-Compact Disposal Facilities		Compact Affiliated Disposal Facility Only		Combination of Compact Affiliated and Non-Compact Disposal Facilities					
Year	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR
2022	10.013				38.742				13.711			
2020	11.019				32.973				12.793			
2018	10.854				32.329				12.853			
2016	8.706				30.061				12.471			
2012	7.335				30.581							
2010	8.035				27.292							
2008	8.283				25.231							
2006	6.829				22.933							
2004	5.374				19.500							
2002	3.634				17.922							
2000	2.223				17.922							
1998	3.165				15.886							
1997	3.112				15.852							
1996	2.845				12.771							
1995	2.015				12.824							

Geometric Means

From	To	Geometric Mean				Geometric Mean				Geometric Mean					Average of Geometric Means
2020	2022	-4.7%				8.4%				3.5%					2.4%
2018	2022	-2.0%				4.6%				1.6%					1.4%
2016	2022	2.4%				4.3%				1.6%					2.8%
2012	2022	3.2%				2.4%									2.8%
2008	2022	1.4%				3.1%									2.2%
2006	2022	2.4%				3.3%									2.9%
2004	2022	3.5%				3.9%									3.7%
2002	2022	5.2%				3.9%									4.6%
2000	2022	7.1%				3.6%									5.3%
1998	2022	4.9%				3.8%									4.4%
1997	2022	4.8%				3.6%									4.2%
1996	2022	5.0%				4.4%									4.7%
1995	2022	6.1%				4.2%									**5.1%**

Sources

NRC, NUREG-1307, Revision 11, June 2005
NRC, NUREG-1307, Revision 14, November 2010
NRC, NUREG-1307, Revision 15, January 2013
NRC, NUREG-1307, Revision 16, March 2017
NRC, NUREG-1307, Revision 17, February 2019

Estimated Cost at Decommissioning (Evergy Kansas South Response)

In support of K.S.A. 66-128m (b)(6):

1. The amount of money which customers of each owner have been charged for decommissioning up to the date of submission of the plan; and
2. The total amount necessary to meet the projected decommissioning costs of the facility, over the remaining useful life of the facility.

Response

1. The amount of money which customers have been charged for decommissioning up to this time is assumed to equal the amount contributed by Evergy Kansas South to the Wolf Creek Nuclear Decommissioning Trust (NDT). The attached **Schedule A** shows the timing and the amounts contributed to the NDT since inception. To date, Evergy Kansas South has contributed $131.1 million; of which $126.9 million is Kansas-jurisdictional and $4.2 million is FERC-jurisdictional.
2. Based on the Decommissioning Cost Analysis for the Wolf Creek Generating Station prepared by TLG Services, Inc. in August 2023, the estimated cost to decommission the Wolf Creek nuclear unit assuming the DECON alternative, is $1,171,364,000 in 2023 dollars plus the cost to decommission the ISFSI of $11,835,000 in 2023 dollars.

   Based on a proposed annual escalation rate of 3.07%, the total amount necessary to decommission the facility is estimated to be $3,150,250,377. Evergy Kansas South's 47% share of these costs equals $1,480,617,677.

[1] Docket No. 163,561-U is also referred to by its more modern classification, Docket No. 89-WCNE-140-GIE.

Evergy Kansas South, Inc. (f/k/a Kansas Gas and Electric Co.) Wolf Creek Generating Station
NDT Quarterly Contributions

Contribution Date	Contribution Year	Contribution Quarter	Contribution Amount	Annual Contribution based on Calendar Year	Annual Contribution based on Contribution Yr
07/31/86	1986	Q2	$635,256.00		
11/07/86	1986	Q3	211,752.00	$847,008.00	
01/28/87	1986	Q4	230,865.00		$1,077,873.00
04/27/87	1987	Q1	230,865.00		
07/24/87	1987	Q2	234,865.00		
10/28/87	1987	Q3	146,480.00	843,075.00	
03/08/88	1987	Q4	202,487.75		814,697.75
04/28/88	1988	Q1	206,863.00		
07/25/88	1988	Q2	206,862.00		
10/24/88	1988	Q3	206,863.00	823,075.75	
01/23/89	1988	Q4	206,862.00		827,450.00
04/24/89	1989	Q1	206,863.00		
07/26/89	1989	Q2	206,862.00		
10/23/89	1989	Q3	206,863.00	827,450.00	
01/31/90	1989	Q4	206,863.00		827,451.00
04/24/90	1990	Q1	206,863.00		
07/24/90	1990	Q2	206,863.00		
10/26/90	1990	Q3	206,863.00	827,452.00	
01/24/91	1990	Q4	206,863.00		827,452.00
04/22/91	1991	Q1	206,863.00		
07/23/91	1991	Q2	206,862.00		
10/21/91	1991	Q3	206,863.00	827,451.00	
01/23/92	1991	Q4	206,863.00		827,451.00
04/28/92	1992	Q1	815,750.00		
07/23/92	1992	Q2	815,750.00		
10/29/92	1992	Q3	815,750.00	2,654,113.00	
01/20/93	1992	Q4	767,330.00		3,214,580.00
04/16/93	1993	Q1	867,547.50		
07/14/93	1993	Q2	867,547.50		
10/12/93	1993	Q3	867,547.50	3,369,972.50	
01/19/94	1993	Q4	867,547.50		3,470,190.00
04/01/94	1994	Q1	883,523.25		
07/01/94	1994	Q2	883,523.25		
10/01/94	1994	Q3	883,523.25	3,518,117.25	
01/01/95	1994	Q4	883,523.25		3,534,093.00
04/01/95	1995	Q1	899,498.75		
07/01/95	1995	Q2	899,498.75		
10/01/95	1995	Q3	899,498.75	3,582,019.50	
01/01/96	1995	Q4	899,498.75		3,597,995.00
04/01/96	1996	Q1	915,474.50		
07/01/96	1996	Q2	915,474.50		
10/01/96	1996	Q3	915,474.50	3,645,922.25	
01/01/97	1996	Q4	915,474.50		3,661,898.00
04/01/97	1997	Q1	931,450.00		
07/01/97	1997	Q2	931,450.00		
10/06/97	1997	Q3	931,450.00	3,709,824.50	
01/05/98	1997	Q4	931,450.00		3,725,800.00
04/01/98	1998	Q1	947,425.75		
07/01/98	1998	Q2	947,425.75		
10/01/98	1998	Q3	981,241.00	3,807,542.50	

01/04/99	1998	Q4	958,697.50		3,834,790.00
04/01/99	1999	Q1	974,864.25		
07/01/99	1999	Q2	974,864.25		
10/01/99	1999	Q3	974,864.25	3,883,290.25	
01/03/00	1999	Q4	974,864.25		3,899,457.00
04/08/00	2000	Q1	991,031.00		
07/05/00	2000	Q2	991,031.00		
10/02/00	2000	Q3	991,031.00	3,947,957.25	
01/02/01	2000	Q4	991,031.00		3,964,124.00
04/02/01	2001	Q1	1,007,197.75		
07/02/01	2001	Q2	1,007,197.75		
10/01/01	2001	Q3	1,007,197.75	4,012,624.25	
01/02/02	2001	Q4	1,007,197.75		4,028,791.00
04/01/02	2002	Q1	1,018,502.00		
07/01/02	2002	Q2	1,018,502.00		
10/01/02	2002	Q3	961,419.00	4,005,620.75	
01/02/03	2002	Q4	847,253.00		3,845,676.00
04/01/03	2003	Q1	961,419.00		
07/01/03	2003	Q2	961,419.00		
10/01/03	2003	Q3	961,419.00	3,731,510.00	
01/02/04	2003	Q4	961,419.00		3,845,676.00
04/01/04	2004	Q1	961,419.00		
07/01/04	2004	Q2	961,419.00		
10/01/04	2004	Q3	961,419.00	3,845,676.00	
01/03/05	2004	Q4	980,413.00		3,864,670.00
04/01/05	2005	Q1	966,167.50		
07/01/05	2005	Q2	966,167.50		
10/03/05	2005	Q3	966,167.50	3,878,915.50	
01/03/06	2005	Q4	966,167.50		3,864,670.00
04/03/06	2006	Q1	966,167.50		
07/03/06	2006	Q2	966,167.50		
10/02/06	2006	Q3	966,167.50	3,864,670.00	
01/02/07	2006	Q4	966,167.50		3,864,670.00
04/02/07	2007	Q1	723,658.75		
07/02/07	2007	Q2	723,658.75		
10/01/07	2007	Q3	723,658.75	3,137,143.75	
01/02/08	2007	Q4	723,658.75		2,894,635.00
04/01/08	2008	Q1	723,658.75		
07/01/08	2008	Q2	723,658.75		
09/01/08	2008	Q2	723,658.75	2,894,635.00	
01/02/09	2008	Q4	723,658.75		2,894,635.00
04/01/09	2009	Q1	723,658.75		
07/01/09	2009	Q2	723,658.75		
10/01/09	2009	Q3	723,658.75	2,894,635.00	
01/04/10	2009	Q4	723,658.75		2,894,635.00
04/01/10	2010	Q1	787,517.50		
07/01/10	2010	Q2	787,517.50		
10/01/10	2010	Q3	787,517.50	3,086,211.25	
01/04/11	2010	Q4	787,517.50		3,150,070.00
04/01/11	2011	Q1	787,517.50		
07/01/11	2011	Q2	787,517.50		
10/03/11	2011	Q3	787,517.50	3,150,070.00	
01/03/12	2011	Q4	787,517.50		3,150,070.00
04/02/12	2012	Q1	787,517.50		
07/02/12	2012	Q2	787,517.50		
10/01/12	2012	Q3	787,517.50	3,150,070.00	
01/02/13	2012	Q4	787,517.50		3,150,070.00
04/01/13	2013	Q1	690,620.75		

07/01/13	2013	Q2	690,620.75		
10/01/13	2013	Q3	690,620.75	2,859,379.75	
01/02/14	2013	Q4	690,620.75		2,762,483.00
04/01/14	2014	Q1	690,620.75		
07/01/14	2014	Q2	690,620.75		
10/01/14	2014	Q3	690,620.75	2,762,483.00	
01/02/15	2014	Q4	690,620.75		2,762,483.00
04/01/15	2015	Q1	690,620.75		
07/01/15	2015	Q2	690,620.75		
10/01/15	2015	Q3	690,620.75	2,762,483.00	
01/04/16	2015	Q4	690,620.75		2,762,483.00
04/01/16	2016	Q1	1,443,175.00		
07/01/16	2016	Q2	1,443,175.00		
10/03/16	2016	Q3	1,443,175.00	5,020,145.75	
01/02/17	2016	Q4	1,443,175.00		5,772,700.00
04/03/17	2017	Q1	1,443,175.00		
07/01/17	2017	Q2	1,443,175.00		
10/02/17	2017	Q3	1,443,175.00	5,772,700.00	
01/02/18	2017	Q4	1,443,175.00		5,772,700.00
04/02/18	2018	Q1	1,443,175.00		
07/02/18	2018	Q2	1,443,175.00		
10/01/18	2018	Q3	1,443,175.00	5,772,700.00	
01/02/19	2018	Q4	1,443,175.00		5,772,700.00
04/01/19	2019	Q1	1,443,175.00		
07/01/19	2019	Q2	1,443,175.00		
10/01/20	2020	Q3	1,443,175.00	5,772,700.00	
01/02/20	2019	Q4	1,443,175.00		5,772,700.00
04/01/20	2020	Q1	1,443,175.00		
07/01/20	2020	Q2	1,443,175.00		
10/01/20	2020	Q3	1,443,175.00	5,772,700.00	
01/06/21	2020	Q4	1,443,175.00		5,772,700.00
04/05/21	2021	Q1	1,443,175.00		
07/01/21	2021	Q2	1,443,175.00		
10/01/21	2021	Q3	1,443,175.00	5,772,700.00	
01/03/22	2021	Q4	1,443,175.00		5,772,700.00
04/01/22	2022	Q1	1,443,175.00		
07/01/22	2022	Q2	1,443,175.00		
10/03/22	2022	Q3	1,443,175.00	5,772,700.00	
01/03/23	2022	Q4	1,443,175.00		5,772,700.00
04/03/23	2023	Q1	1,443,175.00		
07/03/23	2023	Q2	1,443,175.00		
				4,329,525.00	
					2,886,350.00
			131,136,268.75	131,136,268.75	131,136,268.75

Schedule B

Evergy Kansas South 2023 Funding Analysis

DECOMMISSIONING COST ASSUMPTIONS	
2023 Decom Cost Est	$ 1,183,198,487
Cost Escalation Rate	3.07%
EKS Share	47.00%
Future Juris Allocation Factor	100.00%
Wtd Historical/Future Alloc Factor	100.00%

Year	2023 Wolf Creek Decom Cost	Escalated Wolf Creek Decom Cost	EKS Kansas Decom Cost
2023	$ -	$ -	$ -
2024	$ -	$ -	$ -
2025	$ -	$ -	$ -
2026	$ -	$ -	$ -
2027	$ -	$ -	$ -
2028	$ -	$ -	$ -
2029	$ -	$ -	$ -
2030	$ -	$ -	$ -
2031	$ -	$ -	$ -
2032	$ -	$ -	$ -
2033	$ -	$ -	$ -
2034	$ -	$ -	$ -
2035	$ -	$ -	$ -
2036	$ -	$ -	$ -
2037	$ -	$ -	$ -
2038	$ -	$ -	$ -
2039	$ -	$ -	$ -
2040	$ -	$ -	$ -
2041	$ -	$ -	$ -
2042	$ -	$ -	$ -
2043	$ -	$ -	$ -
2044	$ -	$ -	$ -
2045	$ 78,763,511	$ 152,695,980	$ 71,767,111
2046	$ 167,311,059	$ 340,805,941	$ 160,178,792
2047	$ 195,793,622	$ 439,742,362	$ 206,678,910
2048	$ 214,553,540	$ 478,672,799	$ 224,976,216
2049	$ 96,789,401	$ 229,033,682	$ 107,645,830
2050	$ 53,355,651	$ 118,291,924	$ 55,597,204
2051	$ 48,724,496	$ 105,688,864	$ 49,673,766
2052	$ 15,376,748	$ 35,043,045	$ 16,470,231
2053	$ 10,231,654	$ 24,457,804	$ 11,495,168
2054	$ 10,231,654	$ 25,183,531	$ 11,836,260
2055	$ 10,499,029	$ 26,492,163	$ 12,451,317
2056	$ 10,258,221	$ 26,771,188	$ 12,582,458
2057	$ 10,231,654	$ 27,494,456	$ 12,922,394
2058	$ 10,499,029	$ 28,913,976	$ 13,589,569
2059	$ 10,231,654	$ 29,153,440	$ 13,702,117
2060	$ 10,258,221	$ 30,099,417	$ 14,146,726
2061	$ 10,499,029	$ 31,560,815	$ 14,833,583
2062	$ 10,231,654	$ 31,834,274	$ 14,962,109
2063	$ 10,231,654	$ 32,782,351	$ 15,407,705
2064	$ 10,525,596	$ 34,542,553	$ 16,235,000
2065	$ 10,231,654	$ 34,765,253	$ 16,339,669
2066	$ 10,231,654	$ 35,801,854	$ 16,826,872
2067	$ 10,499,029	$ 37,616,346	$ 17,679,683
2068	$ 10,258,221	$ 38,069,840	$ 17,892,825
2069	$ 10,499,029	$ 39,886,798	$ 18,746,795
2070	$ 10,231,654	$ 40,271,277	$ 18,927,500
2071	$ 10,231,654	$ 41,474,401	$ 19,492,969
2072	$ 10,525,596	$ 43,668,394	$ 20,524,145
2073	$ 10,231,654	$ 43,991,030	$ 20,675,784
2074	$ 10,231,654	$ 45,306,799	$ 21,294,196
2075	$ 10,499,029	$ 47,567,871	$ 22,356,899
2076	$ 10,258,221	$ 48,185,757	$ 22,647,306
2077	$ 10,231,654	$ 49,498,254	$ 23,264,179
2078	$ 28,016,192	$ 118,874,316	$ 55,870,928
2079	$ 26,424,512	$ 236,011,623	$ 110,925,463
	$ 1,183,198,487	$ 3,150,250,377	$ 1,480,617,677
EKS %	47.0%	47.0%	
EKS Share	**$ 556,103,289**	**$ 1,480,617,677**	
		100.0000%	
KS Jurisdictional Share --->		**$ 1,480,617,677**	

Estimated Cost at Decommissioning (Evergy Kansas Metro Response)

In support of K.S.A. 66-128m (b)(6):

1. The amount of money which customers of each owner have been charged for decommissioning up to the date of submission of the plan; and
2. The total amount necessary to meet the projected decommissioning costs of the facility, over the remaining useful life of the facility.

Response

1. The amount of money which customers have been charged for decommissioning up to this time is assumed to equal the amount contributed by Evergy Kansas Metro to the Wolf Creek Nuclear Decommissioning Trust (NDT). The attached **Schedule A** shows the timing and the amounts contributed to the NDT since inception. To date, Evergy Kansas Metro has contributed $113.4 million, $53.5 million of which is Kansas-jurisdictional and $59.9 million is Missouri-jurisdictional.
2. Based on the Decommissioning Cost Analysis for the Wolf Creek Generating Station prepared by TLG Services, Inc. in August 2023, the estimated cost to decommission the Wolf Creek nuclear unit assuming the DECON alternative, is $1,171,364,000 in 2023 dollars plus the cost to decommission the ISFSI of $11,835,000 in 2023 dollars.

   Based on a proposed annual escalation rate of 3.07%, the total amount necessary to decommission the facility is estimated to be $3,150,250,377. Evergy Metro Inc.'s 47% share of these costs equals $1,480,617,677, of which Evergy Kansas Metro's jurisdictional share is $664,561,050.

DECOMMISSIONING COST ASSUMPTIONS

Decommissioning Cost Estimate in 2023 Dollars: $1,171,364,000 + 11,835,000 = 1,183,198,000
Cost Escalation Rate: 3.07%; Evergy Metro Share: 47.00%; Weighted Allocation Factor: 44.88%

Schedule A

Evergy Metro, Inc. (f/k/a Kansas City Power & Light Company)
Wolf Creek Nuclear Decommissioning Trust
Contributions

Contribution Date	Contribution Year	Contribution Quarter	Missouri Jurisdictional Amount	Kansas Jurisdictional Amount	Total Contribution Amount
8/15/1986	1986	Q2	$ 125,198.93	$ 190,106.50	$ 315,305.43
10/15/1986	1986	Q3	$ 200,750.01	$ 63,135.00	$ 263,885.01
1/15/1987	1986	Q4	$ 200,750.01	$ 63,135.00	$ 263,885.01
4/15/1987	1987	Q1	$ 200,750.01	$ 63,135.00	$ 263,885.01
7/15/1987	1987	Q2	$ 200,750.01	$ 63,135.00	$ 263,885.01
10/15/1987	1987	Q3	$ 200,750.01	$ 63,135.00	$ 263,885.01
1/15/1988	1987	Q4	$ 200,750.01	$ 63,135.00	$ 263,885.01
4/15/1988	1988	Q1	$ 200,750.01	$ 63,135.00	$ 263,885.01
7/15/1988	1988	Q2	$ 200,750.01	$ 63,135.00	$ 263,885.01
10/15/1988	1988	Q3	$ 200,750.01	$ 63,135.00	$ 263,885.01
1/15/1989	1988	Q4	$ 200,750.01	$ 63,135.00	$ 263,885.01
4/15/1989	1989	Q1	$ 200,750.01	$ 63,135.00	$ 263,885.01
7/15/1989	1989	Q2	$ 200,750.01	$ 63,135.00	$ 263,885.01
10/15/1989	1989	Q3	$ 200,750.01	$ 63,135.00	$ 263,885.01
1/15/1990	1989	Q4	$ 200,750.01	$ 63,135.00	$ 263,885.01
4/15/1990	1990	Q1	$ 200,750.01	$ 112,305.00	$ 313,055.01
7/15/1990	1990	Q2	$ 200,750.01	$ 210,645.00	$ 411,395.01
10/15/1990	1990	Q3	$ 200,750.01	$ 210,645.00	$ 411,395.01
1/15/1991	1990	Q4	$ 200,750.01	$ 210,645.00	$ 411,395.01
4/15/1991	1991	Q1	$ 200,750.01	$ 210,645.00	$ 411,395.01
7/15/1991	1991	Q2	$ 200,750.01	$ 210,645.00	$ 411,395.01
10/15/1991	1991	Q3	$ 200,750.01	$ 210,645.00	$ 411,395.01
1/15/1992	1991	Q4	$ 200,750.01	$ 210,645.00	$ 411,395.01
4/15/1992	1992	Q1	$ 200,750.01	$ 210,645.00	$ 411,395.01
7/15/1992	1992	Q2	$ 200,750.01	$ 210,645.00	$ 411,395.01
10/15/1992	1992	Q3	$ 951,177.99	$ 210,645.00	$ 1,161,822.99
1/15/1993	1992	Q4	$ 575,964.00	$ 210,645.00	$ 786,609.00
4/15/1993	1993	Q1	$ 575,964.00	$ 210,645.00	$ 786,609.00
7/15/1993	1993	Q2	$ 575,964.00	$ 210,645.00	$ 786,609.00
10/15/1993	1993	Q3	$ 575,964.00	$ 210,645.00	$ 786,609.00
1/15/1994	1993	Q4	$ 575,964.00	$ 210,645.00	$ 786,609.00
4/15/1994	1994	Q1	$ 575,964.00	$ 210,645.00	$ 786,609.00
7/15/1994	1994	Q2	$ 575,964.00	$ 210,645.00	$ 786,609.00
10/15/1994	1994	Q3	$ 575,964.00	$ 210,645.00	$ 786,609.00
1/15/1995	1994	Q4	$ 575,964.00	$ 210,645.00	$ 786,609.00
3/15/1995	1995	Q1	$ -	$ 52,420.00	$ 52,420.00
4/15/1995	1995	Q1	$ 575,964.00	$ 223,750.00	$ 799,714.00
7/15/1995	1995	Q2	$ 575,964.00	$ 223,750.00	$ 799,714.00
10/15/1995	1995	Q3	$ 575,964.00	$ 223,750.00	$ 799,714.00
1/15/1996	1995	Q4	$ 575,964.00	$ 223,750.00	$ 799,714.00
4/15/1996	1996	Q1	$ 575,964.00	$ 223,750.00	$ 799,714.00
7/15/1996	1996	Q2	$ 575,964.00	$ 223,750.00	$ 799,714.00
9/15/1996	1996	Q2	$ 575,964.00	$ 223,750.00	$ 799,714.00
1/15/1997	1996	Q4	$ 575,964.00	$ 223,750.00	$ 799,714.00
4/15/1997	1997	Q1	$ 575,964.00	$ 250,022.25	$ 825,986.25
7/15/1997	1997	Q2	$ 575,964.00	$ 250,022.25	$ 825,986.25
10/15/1997	1997	Q3	$ 575,964.00	$ 250,022.25	$ 825,986.25
1/15/1998	1997	Q4	$ 575,964.00	$ 250,022.25	$ 825,986.25
4/15/1998	1998	Q1	$ 575,964.00	$ 250,022.25	$ 825,986.25
7/15/1998	1998	Q2	$ 575,964.00	$ 250,022.25	$ 825,986.25

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10/15/1998	1998	Q3	$	575,964.00	$	250,022.25	$	825,986.25
1/15/1999	1998	Q4	$	575,964.00	$	250,022.25	$	825,986.25
4/15/1999	1999	Q1	$	575,964.00	$	250,022.25	$	825,986.25
7/15/1999	1999	Q2	$	575,964.00	$	250,022.25	$	825,986.25
10/15/1999	1999	Q3	$	575,964.00	$	250,022.25	$	825,986.25
1/15/2000	1999	Q4	$	575,964.00	$	250,022.25	$	825,986.25
4/15/2000	2000	Q1	$	575,964.00	$	279,379.00	$	855,343.00
7/15/2000	2000	Q2	$	575,964.00	$	279,379.00	$	855,343.00
10/15/2000	2000	Q3	$	575,964.00	$	279,379.00	$	855,343.00
1/15/2001	2000	Q4	$	575,964.00	$	279,379.00	$	855,343.00
4/15/2001	2001	Q1	$	575,964.00	$	279,379.00	$	855,343.00
7/15/2001	2001	Q2	$	575,964.00	$	279,379.00	$	855,343.00
10/15/2001	2001	Q3	$	575,964.00	$	279,379.00	$	855,343.00
1/15/2002	2001	Q4	$	575,964.00	$	279,379.00	$	855,343.00
4/15/2002	2002	Q1	$	575,964.00	$	279,379.00	$	855,343.00
7/15/2002	2002	Q2	$	575,964.00	$	279,379.00	$	855,343.00
10/15/2002	2002	Q3	$	575,964.00	$	279,379.00	$	855,343.00
1/15/2003	2002	Q4	$	575,964.00	$	279,379.00	$	855,343.00
4/15/2003	2003	Q1	$	575,964.00	$	312,183.00	$	888,147.00
7/15/2003	2003	Q2	$	575,964.00	$	312,183.00	$	888,147.00
10/15/2003	2003	Q3	$	575,964.00	$	312,183.00	$	888,147.00
1/15/2004	2003	Q4	$	575,964.00	$	312,183.00	$	888,147.00
4/15/2004	2004	Q1	$	575,964.00	$	312,183.00	$	888,147.00
7/15/2004	2004	Q2	$	575,964.00	$	312,183.00	$	888,147.00
10/15/2004	2004	Q3	$	575,964.00	$	312,183.00	$	888,147.00
1/15/2005	2004	Q4	$	575,964.00	$	312,183.00	$	888,147.00
4/15/2005	2005	Q1	$	575,964.00	$	312,183.00	$	888,147.00
7/15/2005	2005	Q2	$	575,964.00	$	312,183.00	$	888,147.00
10/15/2005	2005	Q3	$	575,964.00	$	312,183.00	$	888,147.00
1/15/2006	2005	Q4	$	575,964.00	$	312,183.00	$	888,147.00
4/15/2006	2006	Q1	$	575,964.00	$	348,838.75	$	924,802.75
7/15/2006	2006	Q2	$	575,964.00	$	348,838.75	$	924,802.75
10/15/2006	2006	Q3	$	575,964.00	$	348,838.75	$	924,802.75
1/15/2007	2006	Q4	$	575,964.00	$	348,838.75	$	924,802.75
4/15/2007	2007	Q1	$	320,316.00	$	598,115.00	$	918,431.00
7/15/2007	2007	Q2	$	320,316.00	$	598,115.00	$	918,431.00
10/15/2007	2007	Q3	$	320,316.00	$	598,115.00	$	918,431.00
1/15/2008	2007	Q4	$	320,316.00	$	598,115.00	$	918,431.00
4/15/2008	2008	Q1	$	320,316.00	$	598,115.00	$	918,431.00
7/15/2008	2008	Q2	$	320,316.00	$	598,115.00	$	918,431.00
10/15/2008	2008	Q3	$	320,316.00	$	598,115.00	$	918,431.00
1/15/2009	2008	Q4	$	320,316.00	$	598,115.00	$	918,431.00
4/15/2009	2009	Q1	$	320,316.00	$	598,115.00	$	918,431.00
7/15/2009	2009	Q2	$	320,316.00	$	598,115.00	$	918,431.00
10/15/2009	2009	Q3	$	320,316.00	$	598,115.00	$	918,431.00
1/15/2010	2009	Q4	$	320,316.00	$	598,115.00	$	918,431.00
4/15/2010	2010	Q1	$	320,316.00	$	598,115.00	$	918,431.00
7/15/2010	2010	Q2	$	320,316.00	$	598,115.00	$	918,431.00
11/15/2010	2010	Q3	$	320,316.00	$	598,115.00	$	918,431.00
1/15/2011	2010	Q4	$	320,316.00	$	568,430.00	$	888,746.00
4/15/2011	2011	Q1	$	320,316.00	$	509,057.50	$	829,373.50
7/15/2011	2011	Q2	$	320,316.00	$	509,057.50	$	829,373.50
10/15/2011	2011	Q3	$	320,316.00	$	509,057.50	$	829,373.50
1/15/2012	2011	Q4	$	320,316.00	$	509,057.50	$	829,373.50
4/15/2012	2012	Q1	$	320,316.00	$	509,057.50	$	829,373.50
7/15/2012	2012	Q2	$	320,316.00	$	509,057.50	$	829,373.50
10/15/2012	2012	Q3	$	320,316.00	$	509,057.50	$	829,373.50
1/15/2013	2012	Q4	$	320,316.00	$	509,057.50	$	829,373.50

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4/15/2013	2013	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2013	2013	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2013	2013	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2014	2013	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2014	2014	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2014	2014	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2014	2014	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2015	2014	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2015	2015	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2015	2015	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2015	2015	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2016	2015	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2016	2016	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2016	2016	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2016	2016	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2017	2016	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2017	2017	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2017	2017	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2017	2017	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2018	2017	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2018	2018	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2018	2018	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2018	2018	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2019	2018	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2019	2019	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2019	2019	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2019	2019	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2020	2019	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/15/2020	2020	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/15/2020	2020	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/16/2020	2020	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/15/2021	2020	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/16/2021	2021	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/16/2021	2021	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/15/2021	2021	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/21/2022	2021	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/14/2022	2022	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/14/2022	2022	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
10/21/2022	2022	Q3	$ 320,316.00	$ 509,057.50	$ 829,373.50
1/19/2023	2022	Q4	$ 320,316.00	$ 509,057.50	$ 829,373.50
4/20/2023	2023	Q1	$ 320,316.00	$ 509,057.50	$ 829,373.50
7/20/2023	2023	Q2	$ 320,316.00	$ 509,057.50	$ 829,373.50
12/31/2022			(197,076,272)	(141,056,132)	(338,132,404)
Total Contributions			**$ 59,865,181.16**	**$ 53,518,372.50**	**$ 113,383,553.66**

Schedule B

2023 Evergy Kansas Metro Funding Analysis

DECOMMISSIONING COST ASSUMPTIONS	
2023 Decom Cost Est	$ 1,183,198,487
Cost Escalation Rate	**3.07%**
Metro Share	47.00%
Future Juris Allocation Factor	46.75%
Wtd Historical/Future Alloc Factor	44.88%

Year	2023 Wolf Creek Decom Cost	Escalated Wolf Creek Decom Cost	Metro Kansas Decom Cost
2023	$ -	$ -	$ -
2024	$ -	$ -	$ -
2025	$ -	$ -	$ -
2026	$ -	$ -	$ -
2027	$ -	$ -	$ -
2028	$ -	$ -	$ -
2029	$ -	$ -	$ -
2030	$ -	$ -	$ -
2031	$ -	$ -	$ -
2032	$ -	$ -	$ -
2033	$ -	$ -	$ -
2034	$ -	$ -	$ -
2035	$ -	$ -	$ -
2036	$ -	$ -	$ -
2037	$ -	$ -	$ -
2038	$ -	$ -	$ -
2039	$ -	$ -	$ -
2040	$ -	$ -	$ -
2041	$ -	$ -	$ -
2042	$ -	$ -	$ -
2043	$ -	$ -	$ -
2044	$ -	$ -	$ -
2045	$ 78,763,511	$ 152,695,980	$ 32,211,980
2046	$ 167,311,059	$ 340,805,941	$ 71,894,715
2047	$ 195,793,622	$ 439,742,362	$ 92,765,847
2048	$ 214,553,540	$ 478,672,799	$ 100,978,418
2049	$ 96,789,401	$ 229,033,682	$ 48,315,799
2050	$ 53,355,651	$ 118,291,924	$ 24,954,272
2051	$ 48,724,496	$ 105,688,864	$ 22,295,594
2052	$ 15,376,748	$ 35,043,045	$ 7,392,505
2053	$ 10,231,654	$ 24,457,804	$ 5,159,496
2054	$ 10,231,654	$ 25,183,531	$ 5,312,592
2055	$ 10,499,029	$ 26,492,163	$ 5,588,654
2056	$ 10,258,221	$ 26,771,188	$ 5,647,516
2057	$ 10,231,654	$ 27,494,456	$ 5,800,093
2058	$ 10,499,029	$ 28,913,976	$ 6,099,548
2059	$ 10,231,654	$ 29,153,440	$ 6,150,064
2060	$ 10,258,221	$ 30,099,417	$ 6,349,622
2061	$ 10,499,029	$ 31,560,815	$ 6,657,912
2062	$ 10,231,654	$ 31,834,274	$ 6,715,599
2063	$ 10,231,654	$ 32,782,351	$ 6,915,601
2064	$ 10,525,596	$ 34,542,553	$ 7,286,924
2065	$ 10,231,654	$ 34,765,253	$ 7,333,904
2066	$ 10,231,654	$ 35,801,854	$ 7,552,580
2067	$ 10,499,029	$ 37,616,346	$ 7,935,356
2068	$ 10,258,221	$ 38,069,840	$ 8,031,023
2069	$ 10,499,029	$ 39,886,798	$ 8,414,319
2070	$ 10,231,654	$ 40,271,277	$ 8,495,427
2071	$ 10,231,654	$ 41,474,401	$ 8,749,232
2072	$ 10,525,596	$ 43,668,394	$ 9,212,066
2073	$ 10,231,654	$ 43,991,030	$ 9,280,128
2074	$ 10,231,654	$ 45,306,799	$ 9,557,696
2075	$ 10,499,029	$ 47,567,871	$ 10,034,680
2076	$ 10,258,221	$ 48,185,757	$ 10,165,026
2077	$ 10,231,654	$ 49,498,254	$ 10,441,904
2078	$ 28,016,192	$ 118,874,316	$ 25,077,131
2079	$ 26,424,512	$ 236,011,623	$ 49,787,831
	$ 1,183,198,487	$ 3,150,250,377	$ 664,561,050
Metro %	47.0%	47.0%	
Metro Share	**$ 556,103,289**	**$ 1,480,617,677**	
		44.8840%	
KS Jurisdictional Share --->		**$ 664,561,050**	

Estimated Cost a Decommission (KEPCo Response)

In support of K.S.A. 66-128m (b)(6):

1. The amount of money which customers of each owner have been charged for decommissioning up to the date of submission of the plan; and
2. The total amount necessary to meet the projected decommission costs of the facility, over the remaining useful life of the facility.

Response

1. The amount of money that KEPCo's member have been charged for decommissioning to date equals the amount contributed by KEPCo to its Decommissioning Trust. The attached **Schedule A** shows the timing and amounts contributed to KEPCo's Decommissioning Trust since its inception. To date, KEPCo has contributed $13,371,099.
2. Based on the Decommissioning Cost Analysis for the Wolf Creek Generating Station prepared by TLG Services, Inc. in June 2023, the estimated cost to decommission the Wolf Creek nuclear unit using the DECON alternative is $1,171,363,486 in 2023 dollars. Based on a proposed escalation rate of 3.07 percent, the total amount necessary to decommission the facility is estimated to be $3,039,317,169. KEPCo's six percent share of these costs equals $182,359,030. See attached **Schedule B**.

Kansas Electric Power Cooperative, Inc.
Wolf Creek Generating Station Nuclear Decommissioning Trust
Nuclear Decommissioning Trust Contributions

Contribution Date	Contribution Year	Contribution Quarter	Contribution Amount
9/30/1986	1986	Q3	53,000.00
12/31/1986	1986	Q4	53,000.00
3/31/1987	1987	Q1	26,500.00
6/30/1987	1987	Q2	26,500.00
9/30/1987	1987	Q3	26,500.00
12/31/1987	1987	Q4	26,500.00
3/31/1988	1988	Q1	26,500.00
6/30/1988	1988	Q2	26,500.00
9/30/1988	1988	Q3	26,500.00
12/31/1988	1988	Q4	26,500.00
3/31/1989	1989	Q1	26,500.00
6/30/1989	1989	Q2	26,500.00
9/30/1989	1989	Q3	26,500.00
12/31/1989	1989	Q4	26,500.00
3/31/1990	1990	Q1	59,450.00
6/30/1990	1990	Q2	59,450.00
9/30/1990	1990	Q3	59,450.00
12/31/1990	1990	Q4	59,450.00
3/31/1991	1991	Q1	59,450.00
6/30/1991	1991	Q2	59,450.00
9/30/1991	1991	Q3	59,450.00
12/31/1991	1991	Q4	59,450.00
3/31/1992	1992	Q1	59,450.00
6/30/1992	1992	Q2	59,450.00
9/30/1992	1992	Q3	59,450.00
12/31/1992	1992	Q4	59,450.00
3/31/1993	1993	Q1	66,584.00
6/30/1993	1993	Q2	66,584.00
9/30/1993	1993	Q3	66,584.00
12/31/1993	1993	Q4	66,584.00
3/31/1994	1994	Q1	66,584.00
6/30/1994	1994	Q2	66,584.00
9/30/1994	1994	Q3	66,584.00
12/31/1994	1994	Q4	66,584.00
3/31/1995	1995	Q1	66,584.00
6/30/1995	1995	Q2	66,584.00
9/30/1995	1995	Q3	66,584.00
12/31/1995	1995	Q4	66,584.00
3/31/1996	1996	Q1	66,584.00
6/30/1996	1996	Q2	66,584.00
9/30/1996	1996	Q3	66,584.00
12/31/1996	1996	Q4	66,584.00
3/31/1997	1997	Q1	53,364.00
6/30/1997	1997	Q2	53,364.00

9/30/1997	1997	Q3	53,364.00
12/31/1997	1997	Q4	53,364.00
3/31/1998	1998	Q1	53,364.00
6/30/1998	1998	Q2	53,364.00
9/30/1998	1998	Q3	53,364.00
12/31/1998	1998	Q4	53,364.00
3/31/1999	1999	Q1	53,364.00
6/30/1999	1999	Q2	53,364.00
9/30/1999	1999	Q3	53,364.00
12/31/1999	1999	Q4	53,364.00
3/31/2000	2000	Q1	59,629.75
6/30/2000	2000	Q2	59,629.75
9/28/2000	2000	Q3	131,484.25
12/27/2000	2000	Q4	83,581.25
3/30/2001	2001	Q1	84,834.00
6/30/2001	2001	Q2	84,834.00
9/27/2001	2001	Q3	84,834.00
12/26/2001	2001	Q4	84,834.00
3/29/2002	2002	Q1	86,107.50
6/28/2002	2002	Q2	86,107.50
9/27/2002	2002	Q3	86,107.50
12/30/2002	2002	Q4	86,107.50
3/28/2003	2003	Q1	87,400.00
6/27/2003	2003	Q2	87,400.00
9/29/2003	2003	Q3	87,400.00
12/29/2003	2003	Q4	106,850.00
3/29/2004	2004	Q1	108,450.00
6/28/2004	2004	Q2	108,450.00
9/30/2004	2004	Q3	108,450.00
12/30/2004	2004	Q4	108,450.00
3/30/2005	2005	Q1	110,076.00
6/30/2005	2005	Q2	110,076.00
9/30/2005	2005	Q3	110,076.00
12/29/2005	2005	Q4	110,076.00
3/30/2006	2006	Q1	111,726.00
6/29/2006	2006	Q2	111,726.00
9/28/2006	2006	Q3	111,726.00
12/28/2006	2006	Q4	52,674.00
3/29/2007	2007	Q1	98,400.00
6/28/2007	2007	Q2	98,400.00
9/27/2007	2007	Q3	98,400.00
12/28/2007	2007	Q4	98,400.00
3/26/2008	2008	Q1	99,900.00
6/27/2008	2008	Q2	99,900.00
9/30/2008	2008	Q3	99,900.00
12/30/2008	2008	Q4	99,900.00
3/27/2009	2009	Q1	101,400.00
6/27/2009	2009	Q2	101,400.00
9/29/2009	2009	Q3	101,400.00
12/30/2009	2009	Q4	147,020.00
3/30/2010	2010	Q1	114,495.00

6/29/2010	2010	Q2	114,495.00
9/28/2010	2010	Q3	114,495.00
12/29/2010	2010	Q4	114,495.00
3/29/2011	2011	Q1	116,250.00
6/29/2011	2011	Q2	116,250.00
9/29/2011	2011	Q3	116,250.00
12/29/2011	2011	Q4	116,250.00
3/30/2012	2012	Q1	117,960.00
6/29/2012	2012	Q2	117,960.00
9/28/2012	2012	Q3	117,960.00
12/28/2012	2012	Q4	117,960.00
3/28/2013	2013	Q1	98,040.00
6/27/2013	2013	Q2	98,040.00
9/27/2013	2013	Q3	98,040.00
12/27/2013	2013	Q4	98,040.00
3/28/2014	2014	Q1	99,510.00
6/27/2014	2014	Q2	99,510.00
9/29/2014	2014	Q3	99,510.00
12/29/2014	2014	Q4	99,510.00
3/30/2015	2015	Q1	101,100.00
6/29/2015	2015	Q2	121,350.00
9/29/2015	2015	Q3	121,350.00
12/30/2015	2015	Q4	141,690.00
3/30/2016	2016	Q1	123,180.00
6/29/2016	2016	Q2	123,180.00
9/29/2016	2016	Q3	123,180.00
12/29/2016	2016	Q4	123,180.00
3/29/2017	2017	Q1	125,025.00
6/29/2017	2017	Q2	125,025.00
9/29/2017	2017	Q3	125,025.00
12/29/2017	2017	Q4	125,025.00
3/29/2018	2018	Q1	126,900.00
6/28/2018	2018	Q2	126,900.00
9/27/2018	2018	Q3	126,900.00
12/28/2018	2018	Q4	126,900.00
3/28/2019	2019	Q1	136,005.00
6/27/2019	2019	Q2	136,005.00
9/27/2019	2019	Q3	136,005.00
12/30/2019	2019	Q4	136,005.00
3/27/2020	2020	Q1	136,005.00
6/26/2020	2020	Q2	136,005.00
9/28/2020	2020	Q3	136,005.00
12/29/2020	2020	Q4	136,005.00
3/30/2021	2021	Q1	137,550.00
6/29/2021	2021	Q2	137,550.00
9/29/2021	2021	Q3	137,550.00
12/29/2021	2021	Q4	137,550.00
3/30/2022	2022	Q1	137,550.00
6/29/2022	2022	Q2	137,550.00

9/28/2022	2022	Q3	137,550.00
12/28/2022	2022	Q4	137,550.00
3/30/2023	2023	Q1	137,550.00
6/29/2023	2023	Q2	137,550.00
			13,371,099.00

***Note: From 1985 to 1999, KEPCo's records show total contribution for the year. Assumptions were made in above schedule, on when those contributions were made.**

DECOMMISSIONING COST ASSUMPTIONS

2023 Decom Cost Est	$ 1,171,363,486
Cost Escalation Rate	3.07%
KEPCo Share	6.00%
Future Juris Allocation Factor	100.00%
Wtd Historical/Future Alloc Factor	100.00%

Year	2023 Wolf Creek Decom Cost	Escalated Wolf Creek Decom Cost	KEPCo Decom Cost
2023	$ -	$ -	$ -
2024	$ -	$ -	$ -
2025	$ -	$ -	$ -
2026	$ -	$ -	$ -
2027	$ -	$ -	$ -
2028	$ -	$ -	$ -
2029	$ -	$ -	$ -
2030	$ -	$ -	$ -
2031	$ -	$ -	$ -
2032	$ -	$ -	$ -
2033	$ -	$ -	$ -
2034	$ -	$ -	$ -
2035	$ -	$ -	$ -
2036	$ -	$ -	$ -
2037	$ -	$ -	$ -
2038	$ -	$ -	$ -
2039	$ -	$ -	$ -
2040	$ -	$ -	$ -
2041	$ -	$ -	$ -
2042	$ -	$ -	$ -
2043	$ -	$ -	$ -
2044	$ -	$ -	$ -
2045	$ 78,763,511	$ 152,696,006	$ 9,161,760
2046	$ 167,311,059	$ 340,819,692	$ 20,449,182
2047	$ 195,793,622	$ 439,779,969	$ 26,386,798
2048	$ 214,553,540	$ 478,707,458	$ 28,722,447
2049	$ 96,789,401	$ 229,048,514	$ 13,742,911
2050	$ 53,355,651	$ 118,291,949	$ 7,097,517
2051	$ 48,724,496	$ 105,688,864	$ 6,341,332
2052	$ 15,376,748	$ 35,043,045	$ 2,102,583
2053	$ 10,231,654	$ 24,457,804	$ 1,467,468
2054	$ 10,231,654	$ 25,183,531	$ 1,511,012
2055	$ 10,499,029	$ 26,492,163	$ 1,589,530
2056	$ 10,258,221	$ 26,771,188	$ 1,606,271
2057	$ 10,231,654	$ 27,494,456	$ 1,649,667

2058	$	10,499,029	$	28,913,976	$	1,734,839
2059	$	10,231,654	$	29,153,440	$	1,749,206
2060	$	10,258,221	$	30,099,417	$	1,805,965
2061	$	10,499,029	$	31,560,815	$	1,893,649
2062	$	10,231,654	$	31,834,274	$	1,910,056
2063	$	10,231,654	$	32,782,351	$	1,966,941
2064	$	10,525,596	$	34,542,553	$	2,072,553
2065	$	10,231,654	$	34,765,253	$	2,085,915
2066	$	10,231,654	$	35,801,854	$	2,148,111
2067	$	10,499,029	$	37,616,346	$	2,256,981
2068	$	10,258,221	$	38,069,840	$	2,284,190
2069	$	10,499,029	$	39,886,798	$	2,393,208
2070	$	10,231,654	$	40,271,277	$	2,416,277
2071	$	10,231,654	$	41,474,401	$	2,488,464
2072	$	10,525,596	$	43,668,394	$	2,620,104
2073	$	10,231,654	$	43,991,030	$	2,639,462
2074	$	10,231,654	$	45,306,799	$	2,718,408
2075	$	10,499,029	$	47,567,871	$	2,854,072
2076	$	10,258,221	$	48,185,757	$	2,891,145
2077	$	10,231,654	$	49,498,254	$	2,969,895
2078	$	28,016,192	$	118,874,316	$	7,132,459
2079	$	14,589,512	$	124,977,516	$	7,498,651
	$	1,171,363,486	$	3,039,317,169	$	182,359,030
KEPCo %		6.0%		6.0%		
KEPCo Share	**$**	**70,281,809**	**$**	**182,359,030**		
				100.0000%		
KS Jurisdictional Share --->			**$**	**182,359,030**		

ATTACHMENT 4

Utility Funding Plans

Utility Funding Plans (Evergy Kansas South Response)

In support of K.S.A. 66-128m (b)(4):

1. Individual Owner utility currently approved Annual Contributions and schedules for collection of estimated decommissioning costs through final decommissioning of the Station.
2. Discussion of process for each utility to update its Annual Contribution level through Commission action. Also, discuss the tax status of decommissioning funds and other relevant information, such as investment guidelines, etc.

Response

1. The attached Exhibit shows Evergy Kansas South's currently approved Annual Contributions and schedules for collection of the estimated decommissioning costs through final decommissioning of Wolf Creek.

2. Evergy Kansas South's process for updating its Annual Contribution level is dictated by the two-phase process adopted by the KCC. In accordance with the Kansas Corporation Commission's December 9, 1992 Order in Docket No. 163-561-U[1], Wolf Creek and its owners are required to file an updated decommissioning cost study every three years. Phase 1 consists of the filing of the updated decommissioning cost estimate for the Wolf Creek Generating Station (WCGS) and the Commission's review and approval of that cost estimate, plus approval of a rate of escalation for that cost estimate, applicable to all three owners, to establish the estimated cost of decommissioning in 2045, the year WCGS's operating license expires and the year in which the plant is expected to permanently shut down and begin decommissioning. In Phase 1, the KCC issues one order applicable to all three owners. In Phase 2, Evergy Kansas South recalculates the funding level (Annual Contribution amount) necessary to fully fund its share of the decommissioning of Wolf Creek, taking into account such factors as the new cost estimate, the escalation rate, the timing of decommissioning and the current balance in the nuclear decommissioning trust fund. For determining the funding level, Evergy Kansas South also makes certain assumptions with regard to asset allocations, after-tax investment returns and fund expenses. Evergy Kansas South then files a separate proceeding with the KCC, the purpose of which is to establish by Commission order a new decommissioning funding plan for Evergy Kansas South's share of the updated decommissioning cost. The funding plan sets forth the Annual Contribution amounts. In Evergy Kansas South's case, these Phase 2 proceedings may be related solely to the issue of decommissioning funding, or they may be included as one of many issues in a general rate case.

   Evergy Kansas South's Wolf Creek Generating Station Nuclear Decommissioning Trust is considered a "Qualified Fund" under Internal Revenue Code Section 468A. As such, Evergy Kansas South is permitted to make deductible contributions to the fund based on the IRS "ruling amount." The term "ruling amount" means, with respect to any taxable year, the amount which the Secretary of the Treasury determines to be necessary to fund the total nuclear decommissioning cost with respect to such power plant over the estimated useful life of that power plant. The term is further defined to include the amount necessary

to prevent excessive funding of nuclear decommissioning costs or funding of these costs at a rate more rapid than level funding, taking into account such discount rates as the Secretary deems appropriate.(2) The Federal taxable income for the Evergy Kansas South NDT is subject to the 20% Federal tax rate. It is not subject to state income tax.

The Investment Policy and Guidelines for the Evergy Kansas South Nuclear Decommissioning Trust are included in Evergy Kansas South's Energy's Investment Policy Statement (IPS). Within the policy, we outline the fiduciary standards, the performance standards and the I&B Committee's processes for monitoring investment managers as well as the IRS and Treasury regulations that govern the trust. The Evergy Kansas South Wolf Creek Nuclear Operating Station Decommissioning Trust is subject to FERC regulation and, as such, is governed by the FERC mandate that the funds be managed externally under the "prudent investor" standard. We provide each of our investment managers with the IPS and require that they certify they have read it, understand it and will follow the Investment Policy and Guidelines.

[1] Docket No. 163,561-U is also referred to by its more modern classification, Docket No. 89-WCNE-140-GIE.
[2] Internal Revenue Code Section 468A(d)(2).

Schedule B

Evergy Kansas South 2023 Funding Analysis

DECOMMISSIONING TRUST FUND EARNINGS ASSUMPTIONS

TRUST FUND MANAGEMENT FEE	
Kansas Avg Fund Balance	$ 460,811,907
Kansas Annual Fixed Fee	28,000
Fixed Fee %	0.0061%
FI Fee and Fixed Fee%	0.0227%
Equity Fee and Fixed Fee	0.0194%
Real Estate Fee and Fixed Fee	0.0200%

	US T-Bills	Fixed Income	Real Estate	High Yield	Inter-national	Small Stocks	Lrg Corp Stocks	Weighted After-Tax Earnings
Pre-tax Returns	3.99%	4.91%	6.89%	6.26%	8.96%	8.79%	8.52%	
Effective Tax Rate	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	
Earnings After Fees & Taxes	3.17%	3.91%	5.50%	4.99%	7.15%	7.02%	6.80%	
Year	**Investment Mix**							V
2023	0.0%	25.0%	5.0%	14.0%	20.0%	7.0%	29.0%	5.84%
2024	0.0%	25.0%	5.0%	14.0%	20.0%	7.0%	29.0%	5.84%
2025	0.0%	25.0%	5.0%	14.0%	20.0%	7.0%	29.0%	5.84%
2026	0.0%	25.0%	5.0%	14.0%	20.0%	7.0%	29.0%	5.84%
2027	0.0%	55.0%	5.0%	10.0%	9.0%	6.0%	15.0%	5.01%
2028	0.0%	63.0%	4.0%	8.0%	7.3%	4.3%	13.3%	4.82%
2029	0.0%	71.0%	3.0%	6.0%	5.7%	2.7%	11.7%	4.63%
2030	0.0%	79.0%	2.0%	4.0%	4.0%	1.0%	10.0%	4.43%
2031	3.0%	77.2%	1.9%	3.9%	3.7%	1.0%	9.3%	4.38%
2032	6.0%	75.3%	1.8%	3.9%	3.4%	1.0%	8.6%	4.33%
2033	9.0%	73.5%	1.7%	3.8%	3.1%	1.0%	7.9%	4.27%
2034	12.0%	71.6%	1.6%	3.8%	2.8%	1.0%	7.2%	4.22%
2035	15.0%	69.8%	1.5%	3.7%	2.5%	1.0%	6.5%	4.16%
2036	18.0%	67.9%	1.4%	3.7%	2.2%	1.0%	5.8%	4.11%
2037	21.0%	66.1%	1.3%	3.6%	1.9%	1.0%	5.1%	4.06%
2038	24.0%	64.2%	1.2%	3.6%	1.6%	1.0%	4.4%	4.00%
2039	27.0%	62.4%	1.1%	3.5%	1.3%	1.0%	3.7%	3.95%
2040	30.0%	60.6%	1.0%	3.4%	1.0%	1.0%	3.0%	3.89%
2041	32.0%	58.6%	0.9%	3.5%	1.0%	1.0%	3.0%	3.88%
2042	34.0%	56.6%	0.9%	3.5%	1.0%	1.0%	3.0%	3.86%
2043	36.0%	54.6%	0.8%	3.6%	1.0%	1.0%	3.0%	3.85%
2044	38.0%	52.7%	0.7%	3.6%	1.0%	1.0%	3.0%	3.83%
2045	40.0%	50.7%	0.7%	3.6%	1.0%	1.0%	3.0%	3.82%
2046	42.0%	48.7%	0.6%	3.7%	1.0%	1.0%	3.0%	3.80%
2047	44.0%	46.8%	0.5%	3.7%	1.0%	1.0%	3.0%	3.78%
2048	46.0%	44.8%	0.5%	3.7%	1.0%	1.0%	3.0%	3.77%
2049	48.0%	42.8%	0.4%	3.8%	1.0%	1.0%	3.0%	3.75%
2050	50.0%	40.9%	0.3%	3.8%	1.0%	1.0%	3.0%	3.74%
2051	52.0%	38.9%	0.3%	3.9%	1.0%	1.0%	3.0%	3.72%
2052	54.0%	36.9%	0.2%	3.9%	1.0%	1.0%	3.0%	3.71%
2053	56.0%	34.9%	0.1%	3.9%	1.0%	1.0%	3.0%	3.69%
2054	58.0%	33.0%	0.1%	4.0%	1.0%	1.0%	3.0%	3.68%
2055	60.0%	31.0%	0.0%	4.0%	1.0%	1.0%	3.0%	3.66%
2056	61.0%	30.6%	0.0%	3.7%	0.9%	0.9%	2.8%	3.64%
2057	62.0%	30.2%	0.0%	3.5%	0.9%	0.9%	2.6%	3.62%
2058	63.0%	29.8%	0.0%	3.2%	0.8%	0.8%	2.4%	3.60%
2059	64.0%	29.4%	0.0%	2.9%	0.7%	0.7%	2.2%	3.58%
2060	65.0%	29.0%	0.0%	2.7%	0.7%	0.7%	2.0%	3.56%
2061	66.0%	28.6%	0.0%	2.4%	0.6%	0.6%	1.8%	3.54%
2062	67.0%	28.2%	0.0%	2.1%	0.5%	0.5%	1.6%	3.52%
2063	68.0%	27.8%	0.0%	1.9%	0.5%	0.5%	1.4%	3.50%
2064	69.0%	27.4%	0.0%	1.6%	0.4%	0.4%	1.2%	3.48%
2065	70.0%	27.0%	0.0%	1.3%	0.3%	0.3%	1.0%	3.46%
2066	71.0%	26.6%	0.0%	1.1%	0.3%	0.3%	0.8%	3.44%
2067	72.0%	26.2%	0.0%	0.8%	0.2%	0.2%	0.6%	3.42%
2068	73.0%	25.8%	0.0%	0.5%	0.1%	0.1%	0.4%	3.40%
2069	74.0%	25.4%	0.0%	0.3%	0.1%	0.1%	0.2%	3.38%
2070	75.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.36%
2071	77.8%	22.2%	0.0%	0.0%	0.0%	0.0%	0.0%	3.34%
2072	80.6%	19.4%	0.0%	0.0%	0.0%	0.0%	0.0%	3.32%
2073	83.3%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	3.30%
2074	86.1%	13.9%	0.0%	0.0%	0.0%	0.0%	0.0%	3.28%
2075	88.9%	11.1%	0.0%	0.0%	0.0%	0.0%	0.0%	3.26%
2076	91.7%	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	3.24%
2077	94.4%	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	3.21%
2078	97.2%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	3.19%
2079	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.17%

Schedule B

Evergy Kansas South 2023 Funding Analysis

DECOMMISSIONING TRUST FUND CASH FLOWS

NET AFTER-TAX MARKET VALUE		
June 30, 2023 Market Value	343,237,260	
2023 Remaining Deposits	2,886,350	
Market Value Incl Remaining Deposit		346,123,610
Unrealized Net Gain	24,571,469	
Effective Tax Rate	20.00%	
Tax on Unrealized Net Gain		4,914,294
Net After-Tax Market Value		341,209,316

Annual Accrual Escalation	0.00%

Contribution	$ 5,772,700.00

Year	Trust Fund Contribution	Trust Fund Expenditure	Earnings After Fees & Taxes	Trust Fund Balance
2023		$ -	$ -	$ 341,209,316
2024	$ 5,772,700	$ -	$ 20,070,120	$ 367,052,136
2025	$ 5,772,700	$ -	$ 21,580,625	$ 394,405,461
2026	$ 5,772,700	$ -	$ 23,179,420	$ 423,357,581
2027	$ 5,772,700	$ -	$ 21,315,404	$ 450,445,685
2028	$ 5,772,700	$ -	$ 21,805,517	$ 478,023,902
2029	$ 5,772,700	$ -	$ 22,214,550	$ 506,011,152
2030	$ 5,772,700	$ -	$ 22,536,093	$ 534,319,944
2031	$ 5,772,700	$ -	$ 23,500,573	$ 563,593,218
2032	$ 5,772,700	$ -	$ 24,476,077	$ 593,841,995
2033	$ 5,772,700	$ -	$ 25,461,505	$ 625,076,200
2034	$ 5,772,700	$ -	$ 26,455,689	$ 657,304,589
2035	$ 5,772,700	$ -	$ 27,457,390	$ 690,534,679
2036	$ 5,772,700	$ -	$ 28,465,301	$ 724,772,680
2037	$ 5,772,700	$ -	$ 29,478,043	$ 760,023,423
2038	$ 5,772,700	$ -	$ 30,494,169	$ 796,290,291
2039	$ 5,772,700	$ -	$ 31,512,166	$ 833,575,157
2040	$ 5,772,700	$ -	$ 32,530,453	$ 871,878,310
2041	$ 5,772,700	$ -	$ 33,886,970	$ 911,537,980
2042	$ 5,772,700	$ -	$ 35,284,091	$ 952,594,770
2043	$ 5,772,700	$ -	$ 36,722,752	$ 995,090,222
2044	$ 5,772,700	$ -	$ 38,203,901	$ 1,039,066,823
2045	$ 1,443,175	$ (71,767,111)	$ 38,639,686	$ 1,007,382,574
2046	$ -	$ (160,178,792)	$ 35,999,433	$ 883,203,214
2047	$ -	$ (206,678,910)	$ 30,493,883	$ 707,018,187
2048	$ -	$ (224,976,216)	$ 23,470,240	$ 505,512,211
2049	$ -	$ (107,645,830)	$ 17,461,645	$ 415,328,026
2050	$ -	$ (55,597,204)	$ 14,748,172	$ 374,478,993
2051	$ -	$ (49,673,766)	$ 13,249,299	$ 338,054,526
2052	$ -	$ (16,470,231)	$ 12,305,682	$ 333,889,976
2053	$ -	$ (11,495,168)	$ 12,169,762	$ 334,564,571
2054	$ -	$ (11,836,260)	$ 12,139,186	$ 334,867,497
2055	$ -	$ (12,451,317)	$ 12,091,069	$ 334,507,249
2056	$ -	$ (12,582,458)	$ 12,009,259	$ 333,934,050
2057	$ -	$ (12,922,394)	$ 11,917,068	$ 332,928,723
2058	$ -	$ (13,589,569)	$ 11,805,180	$ 331,144,335
2059	$ -	$ (13,702,117)	$ 11,673,353	$ 329,115,571
2060	$ -	$ (14,146,726)	$ 11,529,132	$ 326,497,977
2061	$ -	$ (14,833,583)	$ 11,361,738	$ 323,026,132
2062	$ -	$ (14,962,109)	$ 11,172,811	$ 319,236,834
2063	$ -	$ (15,407,705)	$ 10,970,039	$ 314,799,168
2064	$ -	$ (16,235,000)	$ 10,741,330	$ 309,305,498
2065	$ -	$ (16,339,669)	$ 10,487,390	$ 303,453,219
2066	$ -	$ (16,826,872)	$ 10,218,427	$ 296,844,774
2067	$ -	$ (17,679,683)	$ 9,921,372	$ 289,086,463
2068	$ -	$ (17,892,825)	$ 9,596,199	$ 280,789,838
2069	$ -	$ (18,746,795)	$ 9,247,900	$ 271,290,943
2070	$ -	$ (18,927,500)	$ 8,871,200	$ 261,234,643
2071	$ -	$ (19,492,969)	$ 8,474,491	$ 250,216,166
2072	$ -	$ (20,524,145)	$ 8,044,273	$ 237,736,294
2073	$ -	$ (20,675,784)	$ 7,581,416	$ 224,641,926
2074	$ -	$ (21,294,196)	$ 7,097,820	$ 210,445,550
2075	$ -	$ (22,356,899)	$ 6,578,371	$ 194,667,021
2076	$ -	$ (22,647,306)	$ 6,023,073	$ 178,042,789
2077	$ -	$ (23,264,179)	$ 5,443,149	$ 160,221,759
2078	$ -	$ (55,870,928)	$ 4,448,694	$ 108,799,525
2079	$ -	$ (110,925,463)	$ 2,132,904	$ 6,966

Utility Funding Plans (Evergy Kansas Metro Response)

In support of K.S.A. 66-128m (b)(4):

1. Individual Owner utility currently approved Annual Contributions and schedules for collection of estimated decommissioning costs through final decommissioning of the Station.
2. Discussion of process for each utility to update its Annual Contribution level through Commission action. Also, discuss the tax status of decommissioning funds and other relevant information, such as investment guidelines, etc.

Response

1. The attached Schedule B shows Evergy Kansas Metro's currently approved Annual Contributions and schedules for collection of the estimated decommissioning costs through final decommissioning of Wolf Creek.

2. In accordance with the Kansas Corporation Commission's (KCC) December 9, 1992 Order in Docket No. 163-561-U, Evergy Metro and the other Wolf Creek owners are required to file an updated nuclear decommissioning cost study every three years. The co-owners hire a decommissioning consultant to project the annual cost to decommission Wolf Creek during the years 2045 through 2079 using current year dollars. The co-owners then escalate the decommissioning costs by an inflation factor approved by the KCC to estimate future required decommissioning costs by year. The co-owners maintain separate Nuclear Decommissioning Trust (NDT) funds to pay their respective share of the future decommissioning costs.

   Evergy Kansas Metro then evaluates the annual contribution it makes to its NDT fund to see if it is adequate to cover the projected cost of future decommissioning. To do this, Evergy Kansas Metro assumes specific annual investment returns based on historical data and applies those to the investment portfolio mix adopted by the company for the NDT fund for each future year, with investment returns reduced by an effective tax rate of 20%. If necessary, Evergy Kansas Metro then files a separate proceeding with the KCC for establishing by Commission order a new decommissioning funding plan for Evergy Kansas Metro's share of the updated decommissioning cost. The funding plan sets forth the Annual Contribution amounts. These proceedings may be related solely to the issue of decommissioning funding, or they may be included as part of a general rate case.

   Evergy Kansas Metro has elected the application of Section 468A of the U.S. Internal Revenue Code ("Code") regarding tax treatment of its NDT Fund. The Code imposes a flat federal tax rate of 20% on the gross income of the Fund for any taxable year and permits contributions to the fund to be deductible for determining taxable income. The Code also imposes certain restrictions designed to prevent excessive funding of the NDT.

   The Investment Guidelines for the Evergy Kansas Metro NDT are attached. The guidelines define the investment policies for the NDT to achieve its objectives, procedures for monitoring and control, and the delegation of responsibilities for the oversight and management of assets.

Schedule B

2023 Evergy Kansas Metro Funding Analysis

DECOMMISSIONING TRUST FUND EARNINGS ASSUMPTIONS

TRUST FUND MANAGEMENT FEE	
Kansas Avg Fund Balance	$ 196,651,911
Kansas Annual Fixed Trustee Fee	40,575
Fixed Trustee Fee %	0.0206%
FI Fee and Fixed Trustee Fee%	0.0188%
Equity Fee and Fixed Trustee Fee	0.0221%

	US T-Bills	Fixed Income	Inter-national	Small Stocks	Lrg Corp Stocks	Weighted After-Tax Earnings
Pre-tax Returns	3.99%	4.91%	8.96%	8.79%	8.52%	
Effective Tax Rate	20.0%	20.0%	20.0%	20.0%	20.0%	
Earnings After Fees & Taxes	3.18%	3.91%	7.15%	7.01%	6.80%	
Year	**Investment Mix**					V
2023	0.0%	30.0%	16.0%	20.0%	34.0%	6.03%
2024	0.0%	30.0%	16.0%	20.0%	34.0%	6.03%
2025	0.0%	30.0%	16.0%	20.0%	34.0%	6.03%
2026	0.0%	30.0%	16.0%	20.0%	34.0%	6.03%
2027	0.0%	60.0%	9.0%	11.0%	20.0%	5.12%
2028	0.0%	65.0%	8.0%	9.3%	17.7%	4.97%
2029	0.0%	70.0%	7.0%	7.7%	15.3%	4.82%
2030	0.0%	75.0%	6.0%	6.0%	13.0%	4.67%
2031	0.0%	75.5%	5.8%	5.8%	12.9%	4.65%
2032	0.0%	76.0%	5.7%	5.6%	12.7%	4.64%
2033	0.0%	76.5%	5.5%	5.4%	12.6%	4.62%
2034	0.0%	77.0%	5.4%	5.2%	12.4%	4.61%
2035	0.0%	77.5%	5.2%	5.0%	12.3%	4.59%
2036	0.0%	78.0%	5.1%	4.8%	12.1%	4.58%
2037	0.0%	78.5%	4.9%	4.6%	12.0%	4.56%
2038	0.0%	79.0%	4.7%	4.4%	11.9%	4.55%
2039	0.0%	79.5%	4.6%	4.2%	11.7%	4.53%
2040	0.0%	80.0%	4.4%	4.0%	11.6%	4.51%
2041	0.7%	80.0%	4.3%	3.7%	11.3%	4.49%
2042	1.3%	80.0%	4.2%	3.5%	11.0%	4.46%
2043	2.0%	80.0%	4.1%	3.2%	10.7%	4.44%
2044	2.7%	80.0%	4.0%	2.9%	10.4%	4.41%
2045	3.3%	80.0%	4.0%	2.7%	10.0%	4.39%
2046	4.0%	80.0%	3.9%	2.4%	9.7%	4.36%
2047	4.7%	80.0%	3.8%	2.1%	9.4%	4.34%
2048	5.3%	80.0%	3.7%	1.9%	9.1%	4.31%
2049	6.0%	80.0%	3.6%	1.6%	8.8%	4.29%
2050	6.7%	80.0%	3.5%	1.3%	8.5%	4.26%
2051	7.3%	80.0%	3.4%	1.1%	8.2%	4.24%
2052	8.0%	80.0%	3.3%	0.8%	7.9%	4.21%
2053	8.7%	80.0%	3.2%	0.5%	7.6%	4.19%
2054	9.3%	80.0%	3.1%	0.3%	7.3%	4.16%
2055	10.0%	80.0%	3.0%	0.0%	7.0%	4.14%
2056	11.3%	79.3%	2.8%	0.0%	6.5%	4.11%
2057	12.7%	78.7%	2.6%	0.0%	6.1%	4.08%
2058	14.0%	78.0%	2.4%	0.0%	5.6%	4.05%
2059	15.3%	77.3%	2.2%	0.0%	5.1%	4.02%
2060	16.7%	76.7%	2.0%	0.0%	4.7%	3.99%
2061	18.0%	76.0%	1.8%	0.0%	4.2%	3.96%
2062	19.3%	75.3%	1.6%	0.0%	3.7%	3.93%
2063	20.7%	74.7%	1.4%	0.0%	3.3%	3.90%
2064	22.0%	74.0%	1.2%	0.0%	2.8%	3.87%
2065	23.3%	73.3%	1.0%	0.0%	2.3%	3.84%
2066	24.7%	72.7%	0.8%	0.0%	1.9%	3.81%
2067	26.0%	72.0%	0.6%	0.0%	1.4%	3.78%
2068	27.3%	71.3%	0.4%	0.0%	0.9%	3.75%
2069	28.7%	70.7%	0.2%	0.0%	0.5%	3.72%
2070	30.0%	70.0%	0.0%	0.0%	0.0%	3.69%
2071	37.8%	62.2%	0.0%	0.0%	0.0%	3.63%
2072	45.6%	54.4%	0.0%	0.0%	0.0%	3.58%
2073	53.3%	46.7%	0.0%	0.0%	0.0%	3.52%
2074	61.1%	38.9%	0.0%	0.0%	0.0%	3.46%
2075	68.9%	31.1%	0.0%	0.0%	0.0%	3.41%
2076	76.7%	23.3%	0.0%	0.0%	0.0%	3.35%
2077	84.4%	15.6%	0.0%	0.0%	0.0%	3.29%
2078	92.2%	7.8%	0.0%	0.0%	0.0%	3.23%
2079	100.0%	0.0%	0.0%	0.0%	0.0%	3.18%

Schedule B

2023 Evergy Kansas Metro Funding Analysis

DECOMMISSIONING TRUST FUND CASH FLOWS

NET AFTER-TAX MARKET VALUE		
June 30, 2023 Market Value	151,269,418	
2023 Remaining Deposits	1,018,115	
Market Value Incl Remaining Deposit		152,287,533
Unrealized Net Gain	56,157,004	
Effective Tax Rate	20.00%	
Tax on Unrealized Net Gain		11,231,401
Net After-Tax Market Value		141,056,132

Annual Accrual Escalation	0.00%

Contribution	$	2,036,766.00

Year	Trust Fund Contribution	Trust Fund Expenditure	Earnings After Fees & Taxes	Trust Fund Balance
2023		$ -		$ 141,056,132
2024	$ 2,036,230	$ -	$ 8,554,906	$ 151,647,268
2025	$ 2,036,230	$ -	$ 9,193,789	$ 162,877,286
2026	$ 2,036,230	$ -	$ 9,871,210	$ 174,784,727
2027	$ 2,036,230	$ -	$ 8,992,525	$ 185,813,482
2028	$ 2,036,230	$ -	$ 9,275,016	$ 197,124,728
2029	$ 2,036,230	$ -	$ 9,537,730	$ 208,698,689
2030	$ 2,036,230	$ -	$ 9,778,460	$ 220,513,379
2031	$ 2,036,230	$ -	$ 10,295,910	$ 232,845,519
2032	$ 2,036,230	$ -	$ 10,833,716	$ 245,715,465
2033	$ 2,036,230	$ -	$ 11,392,578	$ 259,144,273
2034	$ 2,036,230	$ -	$ 11,973,218	$ 273,153,722
2035	$ 2,036,230	$ -	$ 12,576,379	$ 287,766,330
2036	$ 2,036,230	$ -	$ 13,202,821	$ 303,005,381
2037	$ 2,036,230	$ -	$ 13,853,327	$ 318,894,939
2038	$ 2,036,230	$ -	$ 14,528,703	$ 335,459,871
2039	$ 2,036,230	$ -	$ 15,229,773	$ 352,725,874
2040	$ 2,036,230	$ -	$ 15,957,385	$ 370,719,489
2041	$ 2,036,230	$ -	$ 16,676,588	$ 389,432,307
2042	$ 2,036,230	$ -	$ 17,418,882	$ 408,887,419
2043	$ 2,036,230	$ -	$ 18,184,749	$ 429,108,399
2044	$ 2,036,230	$ -	$ 18,974,674	$ 450,119,302
2045	$ 509,058	$ (32,211,980)	$ 19,233,834	$ 437,650,215
2046	$ -	$ (71,894,715)	$ 17,922,171	$ 383,677,670
2047	$ -	$ (92,765,847)	$ 15,137,890	$ 306,049,713
2048	$ -	$ (100,978,418)	$ 11,568,901	$ 216,640,196
2049	$ -	$ (48,315,799)	$ 8,514,117	$ 176,838,514
2050	$ -	$ (24,954,272)	$ 7,140,878	$ 159,025,120
2051	$ -	$ (22,295,594)	$ 6,386,129	$ 143,115,655
2052	$ -	$ (7,392,505)	$ 5,913,504	$ 141,636,654
2053	$ -	$ (5,159,496)	$ 5,851,467	$ 142,328,625
2054	$ -	$ (5,312,592)	$ 5,842,886	$ 142,858,919
2055	$ -	$ (5,588,654)	$ 5,825,387	$ 143,095,652
2056	$ -	$ (5,647,516)	$ 5,792,325	$ 143,240,462
2057	$ -	$ (5,800,093)	$ 5,753,952	$ 143,194,321
2058	$ -	$ (6,099,548)	$ 5,705,565	$ 142,800,338
2059	$ -	$ (6,150,064)	$ 5,647,043	$ 142,297,317
2060	$ -	$ (6,349,622)	$ 5,582,187	$ 141,529,882
2061	$ -	$ (6,657,912)	$ 5,505,589	$ 140,377,559
2062	$ -	$ (6,715,599)	$ 5,418,084	$ 139,080,044
2063	$ -	$ (6,915,601)	$ 5,323,532	$ 137,487,975
2064	$ -	$ (7,286,924)	$ 5,215,909	$ 135,416,961
2065	$ -	$ (7,333,904)	$ 5,095,593	$ 133,178,650
2066	$ -	$ (7,552,580)	$ 4,967,690	$ 130,593,759
2067	$ -	$ (7,935,356)	$ 4,825,734	$ 127,484,138
2068	$ -	$ (8,031,023)	$ 4,669,756	$ 124,122,871
2069	$ -	$ (8,414,319)	$ 4,502,269	$ 120,210,821
2070	$ -	$ (8,495,427)	$ 4,320,716	$ 116,036,110
2071	$ -	$ (8,749,232)	$ 4,098,520	$ 111,385,398
2072	$ -	$ (9,212,066)	$ 3,861,379	$ 106,034,711
2073	$ -	$ (9,280,128)	$ 3,610,331	$ 100,364,915
2074	$ -	$ (9,557,696)	$ 3,351,665	$ 94,158,884
2075	$ -	$ (10,034,680)	$ 3,078,800	$ 87,203,005
2076	$ -	$ (10,165,026)	$ 2,792,488	$ 79,830,466
2077	$ -	$ (10,441,904)	$ 2,498,672	$ 71,887,235
2078	$ -	$ (25,077,131)	$ 2,020,819	$ 48,830,923
2079	$ -	$ (49,787,831)	$ 958,177	$ 1,270

KCP&L WOLF CREEK NUCLEAR DECOMMISSIONING TRUST INVESTMENT GUIDELINES

Effective: January 4, 2010

I. INTRODUCTION

These Investment Guidelines ("Guidelines") define the investment policies and objectives for the KCP&L Wolf Creek Nuclear Decommissioning Trust ("NDT" or "Trust") to achieve its objectives, procedures for monitoring and control, and the delegation of responsibilities for the oversight and management of the Trust's assets. The NDT Committee ("Committee") maintains responsibility for administration of the NDT in accordance with its terms and the promulgation of these Guidelines and may, in its discretion, amend these Guidelines and their Attachments from time to time.

II. PURPOSE OF THE TRUST

Kansas City Power & Light Company (KCP&L) owns a 47 percent (47%) interest in the Wolf Creek Nuclear Operating Corporation, the operating company for Wolf Creek Generating Station ("Wolf Creek"). The sole purpose of the NDT is to invest contributions and investment proceeds and to accumulate assets in order to cover KCP&L's 47% share of the costs and expenses associated with the decommissioning of Wolf Creek.

III. COMPLIANCE WITH REGULATIONS

The Trust has been established and shall be operated in accordance with Sections 468A(e)(4)(c) of the Internal Revenue Code.

Management of the Trust shall be in full compliance with all federal and state laws; and with all orders issued by any applicable federal or state regulatory authorities, including but not necessarily limited to the following:

- The Missouri Public Service Commission (MPSC)
- The Kansas Corporation Commission (KCC)
- The Federal Energy Regulatory Commission (FERC)
- The Internal Revenue Service (IRS)
- The United States Treasury Department
- The Nuclear Regulatory Commission (NRC)

No investments shall be made which would in any way conflict with any federal or state laws, nor with any orders, regulations or requirements of the foregoing. All instructions from the Committee to any other parties necessary to implement the overall investment policies and practices established by these Guidelines shall likewise be in accordance with said Guidelines and with all federal and state laws and with all orders issued by applicable federal or state regulatory authorities.

IV. INVESTMENT PHILOSOPHY

The overall investment philosophy of the Trust shall be to prudently select, monitor, and manage a diversified portfolio of investments in such a manner as to generate sufficient long-term after-tax and after-expense total returns to provide the required level of funds for decommissioning at an acceptable level of risk. Total return is defined as the combination of current income and capital appreciation or depreciation. It is recognized that although a risk-return tradeoff exists, the each Investment Manager shall strive to balance these objectives for the overall benefit of the Trust in a way that minimizes the risk of large losses.

V. INVESTMENT MANAGEMENT RESPONSIBILITIES

A. POLICIES AND PRACTICES

The Committee shall be responsible for establishing and implementing general, overall investment policies and practices; including, but not necessarily limited to:

1. The selection of Investment Managers, advisors, consultants, etc.;

2. The selection of allowable investment vehicles or classes (e.g. various styles of equities, fixed income securities or other asset categories);

3. The specification of allocations between investment vehicles or classes;

4. The specification of allocations between Investment Managers; and

5. Directing contributions to selected investment vehicles or classes/Investment Managers and directing reallocations between investment vehicles or classes/ Investment Managers.

The Committee has the responsibility of establishing the Trust's basic investment policy, making asset allocation decisions, and, in its discretion, appointing each Investment Manager. The responsibility for providing for the Trust's liquidity needs also rests with the Committee. The overall investment policies established by the Committee shall be set forth in these Guidelines, which shall be reviewed and approved, as required, by all applicable federal and state regulatory authorities in accordance with all federal and state laws and with all orders issued by such applicable federal or state regulatory authorities.

B. DAY-TO-DAY MANAGEMENT

Day-to-day management of the Trust shall be the responsibility of each Investment Manager selected by the Committee, who shall have sole responsibility engage and direct NDT investments. Each Investment Manager shall be obligated at all times to adhere to a standard of care, whether in investing or otherwise, that a prudent investor would use in the same circumstances. The term "prudent investor" shall have the same meaning as set forth in the FERC's "Regulations Governing Nuclear Plant Decommissioning Trust" at 18 CFR 35.32(a) (3), or any successor regulation.

Neither KCP&L nor its subsidiaries, affiliates or associates may serve as an Investment Manager or otherwise to engage in day-to-day management of the Trust or mandate individual investment decisions, unless so requested by the Committee after the removal or resignation of an acting Investment Manager and then only until a new Investment Manager has been appointed, as evidenced by an executed investment management agreement. Each Investment Manager shall be responsible for the selection of specific securities for investment. The Committee shall not direct any Investment Manager to invest in any specific, individual securities; however, the Committee does retain the right to instruct each Investment Manager to not invest in certain securities, as it deems appropriate.

Each Investment Manager appointed to carry out the NDT's investment Guidelines shall invest NDT assets in accordance with these Guidelines, any applicable addendum to or modification of these Guidelines, and any investment management contract between each Investment Manager and the Committee. Subject to the general and specific requirements and limitations in these Guidelines, any addendum to or modification of these Guidelines, and the investment management contract between each Investment Manager and the Committee, each Investment Manager is accorded full discretion to select and time individual purchase and sale transactions and to diversify assets appropriately. To the extent these Guidelines appear to any Investment Manager to conflict with the provisions of any addendum or modification, or with each Investment Manager's investment management agreement with the Committee, each Investment Manager shall promptly bring any such conflict to the attention of the Committee, in writing, for resolution.

C. COMMUNICATION AND REPORTING OF INVESTMENT MANAGERS

Each Investment Manager is responsible for frequent and open communication with the Committee on all significant matters pertaining to investment policies and the management of the Trust's assets. Each Investment Manager shall furnish the Chairman of the Committee or designee thereof quarterly written reports setting forth the investment performance of the assets under management by each Investment Manager. The reports shall contain a one-page executive summary and shall be furnished in electronic and hard copy. Each Investment Manager shall meet with the Committee quarterly, or less frequently at the Committee's discretion, to review portfolio performance. In addition to reporting obligations imposed by law or the investment management contract between each Investment Manager and the Committee, each Investment Manager shall promptly report:

1. Significant changes in the Investment Manager's investment outlook, investment strategy, portfolio structure and risk level;

2. Any significant changes in the Investment Manager's ownership, investment process, organizational structure, financial condition, senior personnel staffing or Form ADV filed with the Securities and Exchange Commission;

3. On a quarterly basis all securities held during the quarter, together with certifications that these instruments were prudent investments for the Trust and each Investment Manager has personnel with sufficient expertise to manage them;

4. Any security which declines below the minimum quality standards of the NDT and any action each Investment Manager plans to take with respect to that security;

5. Any proposed change in the NDT's Investment Guidelines, Attachments or addenda thereto, or both, which each Investment Manager believes is necessary to prudently invest the assets of the NDT under its management; and

6. Any litigation, regulatory enforcement action, or formal investigation by a regulatory body in which each Investment Manager, or a sub-advisor, sub-manager, or other investment professional that assists each Investment Manager, is alleged to have committed a breach of fiduciary duty or a violation of other state or federal law.

VI. INVESTMENT OBJECTIVES

The Trust shall seek to achieve a total return that, over the long term, provides sufficient assets to fund its liabilities subject to a level of risk, required contributions, and expense deemed appropriate by the Committee. The Trust shall seek to maximize the return on its assets, over the long term, by investing a portion of such assets in equities and additional asset classes, including, but not limited to, fixed income securities, with differing rates of return, volatility, and correlation. The Trust will diversify its investments within asset classes to reduce the impact of losses in single investments.

A. ASSET CLASSES AND ALLOCATION OF ASSETS

The Committee will maintain an asset allocation policy specifying allocation ranges for each asset class, and will review the ranges from time to time. The ranges are set forth in Attachment A to these Guidelines. Such ranges are intended to serve as guidelines; the Committee will not be required to remain strictly within the designated ranges.

B. ASSET ALLOCATION REBALANCING POLICY

The Committee anticipates rebalancing the portfolio upon the advice of each Investment Manager from time to time. The NDT's asset allocation rebalancing policy targets and ranges are set forth in Attachment B to these Guidelines.

C. CONCENTRATION

For all asset classes, no Investment Manager shall invest more than a total of 5% of the Trust's assets under management by such Manager, measured at market value, in the securities, fixed income or equity, of any one company. Nonetheless, an Investment Manager may exceed this 5% limit if it manages an indexed equity fund, but only to the extent the securities of any one company comprise no more than 5% of the value of the index. In addition, prudent diversification standards should be developed and maintained by each Investment Manager.

D. EQUITY

1. TYPES OF SECURITIES AND MINIMUM REQUIREMENTS

Equity investments shall mean common stocks, preferred stocks, preferred stocks convertible into common stocks and mutual funds, including exchange traded funds, whose underlying assets are primarily common stocks.

2. DIVERSIFICATION

Investments in any particular industry (as defined by the Standard and Poor's 500) shall be limited to no more than 20% of the total equity portion of the Trust's assets under management by an individual Manager. Equity investments in any one company by an individual Manager shall be limited to no more than 5% of the total equity portion of the Trust's assets under management by that Manager, measured at market value. Investments in broadly-based mutual funds, including exchange traded funds designed to replicate broad indexes, are excluded from both the 20% industry and 5% company diversification limitations. Industry and sector specific funds are not excluded from the diversification limitations. Each Investment Manager will use their own judgment as to the weight to be accorded to the ratings of given equities, and the mix and number of issues of stocks held in the portfolio at any given time, within the limits of this paragraph.

3. INTERNATIONAL EQUITY

The Trust may invest in equity investments of foreign companies.

E. FIXED INCOME

1. TYPES OF SECURITIES

Fixed income investments shall mean publicly traded debt securities issued by the United States Government or agencies of the United States Government, domestic corporations and domestic banks and other United States financial institutions.. "Yankee bonds" (debt securities issued by foreign entities which are registered with the Securities and Exchange Commission, denominated in U.S. dollars and which trade domestically) and municipal bonds are also available for investment, so long as they comply with Minimum Quality and Diversification standards referenced herein.

2. MINIMUM QUALITY

To assure liquidity, any purchases of bonds, debentures, or notes with maturities of one year or greater should be of issues with an original outstanding issue size in excess of $50 million. Bonds must be rated "investment grade" by Moody's and Standard and Poor's.

3. DIVERSIFICATION

Except for Treasury and Agency obligations, debt investments of any one entity may not cumulatively exceed 5% of the Trust's assets under management by each Investment Manager, based on market value.

F. CASH EQUIVALENTS

1. TYPES OF SECURITIES

Cash equivalents include publicly traded fixed income securities issued by the United States Government or agencies of the United States Government, commercial paper, certificates of deposit, savings accounts and short-term investment or money market funds of institutional quality of entities domiciled in the U.S.

2. MINIMUM QUALITY

Commercial paper must be only of the highest quality (A-1 as established by Standard and Poor's or P-1 as established by Moody's) with the investment in single issuer limited to 5% of the total portfolio, or approved money market mutual funds. Investment in commercial paper of public utility companies with nuclear plant investments is prohibited.

G. UNINVESTED ASSETS

Assets of the Trust held by each Investment Manager as liquidity or investment reserves shall, at all times, be invested in interest bearing accounts and managed by the custodian bank.

H. INVESTMENT TRANSACTIONS

Subject to the requirements imposed by an investment management agreement between each Investment Manager and the Committee, all transactions are to achieve "best execution" (best price net of trading costs). The lowest commission rate does not necessarily mean "best execution." Subject to the first sentence of this paragraph, responsibility for achieving best execution is retained by each Investment Manager. Firms which offer research services may be given preference as long as the principle of "best execution" and each Investment Manager's option to pay for research are compatible.

I. PROXIES

Voting authority for proxies will be delegated to each Investment Manager or qualified third parties. Proxies must be voted in the interest of preserving or enhancing the security's value and in a manner that best serves the interest of the Trust. Each Investment Manager is prohibited from abstaining from voting proxies, unless they report abstentions and the reasons for them to the Committee. Each Investment Manager is expected to be aware of corporate provisions that may adversely affect stock holdings including, but not limited to, "golden parachutes," "super majorities," "poison pills," "fair price" provisions, staggered boards of directors, and other tactics.

J. SECURITIES LENDING

Upon express authorization of the Company, the Trust may participate in the securities lending program of the Trust's Trustee specifically, to loan any securities to brokers, dealers or banks upon such terms, and secured in such manner, as may be determined by the Trustee, to permit the loaned securities to be transferred into the name of the borrower or others and to

permit the borrower to exercise such rights of ownership over the loaned securities as may be required under the terms of any such loan; provided, that, with respect to the lending of securities pursuant to this paragraph, the Trustee's powers shall subsume the role of custodian (the expressed intent hereunder being that the Trustee, in such case, be deemed a financial institution, within the meaning of Section 101(22) of the Bankruptcy Code); and provided, further, that any loans made from the Trust shall be made in conformity with these Guidelines and all such laws or regulations governing such lending activities which may have been promulgated by any appropriate regulatory body at the time of such loan.

K. RESTRICTIONS

1. ABSOLUTE RESTRICTIONS

The following categories of securities and trading practices are not permissible for investment using the Trust's assets under any circumstance:

A. Investments in any portion of Trust's funds in the securities or assets of any corporation known by the each Investment Manager to be an owner or operator of a nuclear power plant;

B. Investments in any portion of the Trust's funds in any index fund, mutual fund or pooled fund in which more than fifteen percent (15%) of the assets are issued by owners or operators of nuclear power plants;

C. Investments in any portion of the taxqualified or nontax-qualified trust's funds in any affiliated company of KCP&L;

D. Investments in any portion of the taxqualified or nontax-qualified trust's funds in the trustee or each Investment Manager's company or affiliated companies (This limitation does not include time or demand deposits offered through the trustee or each Investment Manager's affiliated banking operations.); and

E. All other restrictions that may now exist or be promulgated.

Further, the total book value of investments in equity securities in the Trust shall not exceed sixty-five percent (65%) of the Trust' book value. All income earned by the Trust's funds shall become a part of the Trust's funds.

If a corporation should assume ownership or operation of a nuclear plant following the investment of the Trust funds, each Investment Manager will sell the affected securities as soon as is reasonably practicable. It is the responsibility of each Investment Manager to screen all investments for prohibition under these criteria.

2. RESTRICTIONS REQUIRING PRIOR WRITTEN APPROVAL

The following categories of securities and trading practices are not permissible for investment using the Trust's assets without the Committee's prior written approval:

a. Unregistered or restricted stock;

b. Commodities, including gold or currency futures;

c. Conditional sales contracts;

d. Options;

e. Futures;

f. Warrants;

g. Margin buying;

h. Leasebacks; and

i. Annuities or Guaranteed Insurance Contracts.

j. Mortgage or Asset-backed Securities

L. PERFORMANCE

The Trust's investment performance will be measured over the long term, taking into account appropriate benchmarks and peer-relative performance comparisons, especially when performance deviates meaningfully from market indexes. Investment objectives for each asset class will be established from time to time in consultation with the each of the Trust's Investment Managers. The investment performance benchmarks are set forth in Attachment C to these Guidelines.

ATTACHMENT A

TO THE

KCP&L WOLF CREEK NUCLEAR DECOMMISSIONING TRUST INVESTMENT GUIDELINES

This Attachment to the Investment Guidelines for the KCP&L Wolf Creek Nuclear Decommissioning Trust ("Trust") sets forth the asset allocation targets and ranges that have been established by the Nuclear Decommissioning Trust Committee (the "Committee") as of December 19, 2009. The Committee may change these targets and ranges from time to time in its discretion. They are intended to serve as guidelines; the Committee is not required to remain strictly within the designated ranges. However, in no event shall the categories of securities, trading practices or asset allocations violate the restrictions set forth the Investment Guidelines and all applicable laws and regulations.

The Trust's asset allocation targets and ranges are as follows:

PERCENTAGE ASSET ALLOCATION OF TRUST ASSETS MEASURED AT MARKET VALUE

Equity	**Allocation**
U.S. Equity	
Large Cap Passive (S&P100)	32%
Total Large Cap	32%
Mid Cap Value	6%
Mid Cap Growth	3%
Total Mid Cap	9%
Small Cap Value	6%
Small Cap Growth	3%
Total Small Cap	9%
Total U.S. Equity	50%
International Equity	
Developed International	12%
Emerging Markets	3%
Total International Equity	15%
Total Equity	**65%**
Fixed Income	
Taxable Bond (Gov/Credit)	35%
Total Fixed Income	**35%**
	100%

ATTACHMENT B

TO THE

KCP&L WOLF CREEK NUCLEAR DECOMMISSIONING TRUST INVESTMENT GUIDELINES

This Attachment to the Investment Guidelines for the KCP&L Wolf Creek Nuclear Decommissioning Trust ("Trust") sets forth the asset allocation rebalancing policy targets and ranges that have been established by the by the Nuclear Decommissioning Trust Committee (the "Committee") as of December 19, 2009. The Committee may change these targets and ranges from time to time in its discretion. They are intended to serve as guidelines; the Committee is not required to remain strictly within the designated ranges. However, in no event shall the categories of securities, trading practices or asset allocations violate the restrictions set forth the Investment Guidelines and all applicable laws and regulations.

The Committee has defined target allocations and acceptable target ranges for each asset class. The rebalancing policy has been established so that actual allocations shall be consistent with those target ranges. Each asset class has been assigned a target and range outside of which rebalancing is necessary. In addition, each commingled fund and/or separate account within each asset class has been assigned a range outside of which rebalancing is necessary. Rebalancing ranges are equal to or less than acceptable range targets.

ASSET ALLOCATION REBALANCING POLICY TARGETS AND RANGES

	Target Market Value Allocation	Rebalance Band	Permissible Market Value Range
Equity			
U.S. Equity			
Large Cap Passive (S&P100)	32%		
Total Large Cap	32%	+/-3%	29% - 35%
Mid Cap Value	6%		
Mid Cap Growth	3%		
Total Mid Cap	9%	+/-2%	7% - 11%
Small Cap Value	6%		
Small Cap Growth	3%		
Total Small Cap	9%	+/-2%	7% - 11%
Total U.S. Equity	50%	+/-4%	46% - 54%
International Equity			
Developed International	12%		
Emerging Markets	3%		
Total International Equity	15%	+/-3%	12% - 18%
Total Equity	**65%**	**+/-5%**	**60% - 70%**
Fixed Income			
Taxable Bond (Gov/Credit)	35%		
Total Fixed Income	**35%**	**+-5%**	**30% - 40%**
	100%		

ATTACHMENT C

TO THE

KCP&L WOLF CREEK NUCLEAR DECOMMISSIONING TRUST INVESTMENT GUIDELINES

This Attachment to the Investment Guidelines for the KCP&L Wolf Creek Nuclear Decommissioning Trust ("Trust") sets forth the performance benchmarks that have been established by the by the Nuclear Decommissioning Trust Committee (the "Committee") as of December 19, 2009. The Committee may change these targets from time to time in its discretion.

PERFORMANCE BENCHMARKS

Performance of the Trust will be compared, over a market cycle, to a representative mix of benchmarks appropriate to each asset class, as follows:

1. Performance in Large Cap U.S. equity investments will be benchmarked against the S&P 100 Index;

2. Performance in Mid Cap U.S. equity investments will be benchmarked against the S&P 400 Index;

3. Performance in Small Cap U.S. equity investments will be benchmarked against the Russell 2000 Index;

4. Performance in international equity investments will be benchmarked against the MCSI EAFE Index; and

5. Performance in fixed income investments will be benchmarked against the Barclays Government/Credit Index.

Utility Funding Plans (KEPCo Response)

In support of K.S.A. 66-128m (b)(4):

1. Individual Owner utility currently approved Annual Contributions and schedules for collection of estimated decommissioning costs through final decommissioning of the Station.
2. Discussion of process for each utility to update its Annual Contribution level through Commission action. Also, discuss the tax status of decommissioning funds and other relevant information, such as investment guidelines, etc.

Response:

1. The attached Schedule C shows KEPCo's current Annual Contributions and schedules for collection of the estimated decommissioning costs through the final decommissioning of Wolf Creek.

2. In accordance with Kansas Corporation Commission's (KCC) December 9, 1992, Order in Docket No. 163-561-U, Wolf Creek and its owners are required to file an updated decommissioning cost study every three years. The co-owners hire a decommissioning consultant to project the annual cost to decommission Wolf Creek during the years 2045 through 2079 using current year dollars. The co-owners then escalate the decommissioning costs by inflation factor approved by the KCC to estimate future required decommissioning costs by year. The co-owners maintain separate decommissioning trust funds to pay their respective shares of the future decommissioning costs.

   KEPCo evaluates the annual contribution it makes to its decommissioning trust fund to determine whether it is adequate to cover the updated projected future cost of decommissioning. To do this, KEPCo assumes specific annual investment returns based on historical data and applies those to the investment portfolio mix adopted by the Company for the decommissioning trust fund. KEPCo then historically has filed a separate proceeding with the KCC for commission approval of a new decommissioning funding plan for collection of KEPCo's share of the updated decommissioning costs, which may be different than or the same as current amounts. However, based on the testimony of staff witness Adam Gatewood in Docket No. 21-WCNE-103-GIE (21-103 Docket), KEPCo includes its updated decommissioning funding plan herein as Schedule D.

   In the 21-103 Docket, Mr. Gatewood indicated that unlike past triennial reviews, where the decommissioning methodology has been reviewed and adopted by the Commission in one docket, followed by separate dockets wherein each Wolf Creek owner files a funding plan, that sufficient information was provided in the Application in that docket to review the funding plans for each owner, completing the triennial review without additional

dockets. (*See* Direct Testimony of Adam H. Gatewood, 21-103 Docket, Dec. 18, 2020, p. 3.) For this triennial review, KEPCo believes that sufficient information has been provided to address both the decommissioning methodology and KEPCo's funding plan, obviating the need for an additional, separate filing.

In Docket No. 142-100-U, the Commission authorized KEPCo to utilize a "…segregated internal funding mechanism…" (p. 54 of the Order dated September 27, 1985) to hold and accumulate its proportionate share of the decommissioning costs to be used to decommission Wolf Creek. For this purpose, KEPCo created a Grantor Trust. The Commission approved the Grantor Trust in its Order dated November 30, 1989, in Docket No. 167,220-U. On October 10, 2003, in Docket 03-KEPE-1000-MIS, the Commission granted KEPCo's application to make amendments to the Grantor Trust. On January 26, 2017, in Docket No. 16-KEPE-584-MIS, the Commission granted KEPCo's application requesting approval of an amended and restated decommissioning trust and a change in trustee. The Grantor Trust is a segregated internal fund administered by an independent, external Trustee, Country Club Trust Company. The income from the Grantor Trust is attributable to KEPCo. KEPCo is tax exempt under Internal Revenue Code Section 501(c)(12).

The investment policy for KEPCo's decommissioning trust fund sets forth investment policy, investment objectives, securities requirements, disbursements of funds, and responsibility. The policy is attached as Schedule E.

Kansas Electric Power Cooperative Inc.
Estimate for Decommissioning Fund Contributions
DECON ALT

KCC Stipulated and Fixed Amounts	
Total Cost DECON ALT Method in 2020 $s	**$1,073,642,247**
Estimated KEPCo Cost in 2020 $s	**$64,418,535**
Forecasted Rate of Inflation	**3.25%**
Remaining Years in Service	**24**
Total KEPCo Cost of Decommissioning	**$199,771,905**
Market Value of Portfolio @ 09/30/2020	**$32,163,880**
Remaining $s To Be Collected	**$167,608,025**
KEPCo Variables	
Forecasted Return on Portfolio	**Table Below**
Annual Payment	**$550,196**
Amount of Excess/Shortfall	**0**

Time	Year	Annual Inflow	Annual Outflow	Annual Earnings	Balance	Annual Return
1	2020	$ -	$ -	$ -	$ 32,299,885	0.00%
2	2021	$ 550,196	$ -	$ 1,679,594	$ 34,497,375	5.20%
3	2022	$ 550,196	$ -	$ 1,793,864	$ 36,806,938	5.20%
4	2023	$ 550,196	$ -	$ 1,913,961	$ 39,234,288	5.20%
5	2024	$ 550,196	$ -	$ 1,911,614	$ 41,656,864	5.20%
6	2025	$ 550,196	$ -	$ 2,166,157	$ 44,331,560	5.20%
7	2026	$ 550,196	$ -	$ 2,305,241	$ 47,142,666	5.20%
8	2027	$ 550,196	$ -	$ 2,451,419	$ 50,097,138	5.20%
9	2028	$ 550,196	$ -	$ 2,605,051	$ 53,202,288	5.20%
10	2029	$ 550,196	$ -	$ 2,766,519	$ 56,465,801	5.20%
11	2030	$ 550,196	$ -	$ 2,936,222	$ 59,895,753	5.20%
12	2031	$ 550,196	$ -	$ 3,114,579	$ 63,500,633	5.20%
13	2032	$ 550,196	$ -	$ 3,302,033	$ 67,289,361	5.20%
14	2033	$ 550,196	$ -	$ 3,499,047	$ 71,271,315	5.20%
15	2034	$ 550,196	$ -	$ 3,706,108	$ 75,456,348	5.20%
16	2035	$ 550,196	$ -	$ 3,923,730	$ 79,854,818	5.20%
17	2036	$ 550,196	$ -	$ 4,152,451	$ 84,477,610	5.20%
18	2037	$ 550,196	$ -	$ 4,392,836	$ 89,336,165	5.20%
19	2038	$ 550,196	$ -	$ 4,645,481	$ 94,442,505	5.20%
20	2039	$ 550,196	$ -	$ 4,911,010	$ 99,809,269	5.20%

21	2040	$ 550,196	$ -	$ 5,190,082	$ 105,449,738	5.20%
22	2041	$ 550,196	$ -	$ 5,483,386	$ 111,377,871	5.20%
23	2042	$ 550,196	$ -	$ 5,791,649	$ 117,608,339	5.20%
24	2043	$ 550,196	$ -	$ 6,115,634	$ 124,156,560	5.20%
25	2044	$ 550,196	$ -	$ 6,456,141	$ 131,038,741	5.20%
26	2045	$ -	$ (10,138,202)	$ 6,814,015	$ 127,583,514	5.20%
27	2046	$ -	$ (22,186,527)	$ 6,634,343	$ 111,903,747	5.20%
28	2047	$ -	$ (29,460,284)	$ 5,818,995	$ 88,150,554	5.20%
29	2048	$ -	$ (30,392,948)	$ 4,583,829	$ 62,253,284	5.20%
30	2049	$ -	$ (15,347,575)	$ 3,237,171	$ 50,080,627	5.20%
31	2050	$ -	$ (6,677,869)	$ 2,604,193	$ 45,956,870	5.20%
32	2051	$ -	$ (6,342,967)	$ 2,389,757	$ 41,957,704	5.20%
33	2052	$ -	$ (2,247,911)	$ 2,181,801	$ 41,849,636	5.20%
34	2053	$ -	$ (1,628,338)	$ 2,176,181	$ 42,355,629	5.20%
35	2054	$ -	$ (1,678,883)	$ 2,202,493	$ 42,836,883	5.20%
36	2055	$ -	$ (1,765,841)	$ 2,227,518	$ 43,255,723	5.20%
37	2056	$ -	$ (1,789,534)	$ 2,249,298	$ 43,672,231	5.20%
38	2057	$ -	$ (1,840,355)	$ 2,270,956	$ 44,059,160	5.20%
39	2058	$ -	$ (1,935,000)	$ 2,291,076	$ 44,371,177	5.20%
40	2059	$ -	$ (1,956,739)	$ 1,974,517	$ 44,344,584	4.45%
41	2060	$ -	$ (2,023,036)	$ 1,973,334	$ 44,250,538	4.45%
42	2061	$ -	$ (2,120,778)	$ 1,969,149	$ 44,054,658	4.45%
43	2062	$ -	$ (2,145,580)	$ 1,960,432	$ 43,825,455	4.45%
44	2063	$ -	$ (2,212,581)	$ 1,950,233	$ 43,519,282	4.45%
45	2064	$ -	$ (2,330,854)	$ 1,610,213	$ 42,755,122	3.70%
46	2065	$ -	$ (2,353,063)	$ 1,581,940	$ 41,941,244	3.70%
47	2066	$ -	$ (2,426,684)	$ 1,551,826	$ 41,024,445	3.70%
48	2067	$ -	$ (2,549,016)	$ 1,517,904	$ 39,952,309	3.70%
49	2068	$ -	$ (2,587,869)	$ 1,478,235	$ 38,802,723	3.70%
50	2069	$ -	$ (2,710,631)	$ 675,167	$ 36,728,456	1.74%
51	2070	$ -	$ (2,645,728)	$ 639,075	$ 34,685,075	1.74%
52	2071	$ -	$ (2,729,428)	$ 603,520	$ 32,524,482	1.74%
53	2072	$ -	$ (2,823,535)	$ 565,926	$ 30,234,348	1.74%
54	2073	$ -	$ (2,904,993)	$ 526,078	$ 27,825,199	1.74%
55	2074	$ -	$ (2,997,034)	$ 484,158	$ 25,284,498	1.74%
56	2075	$ -	$ (3,092,040)	$ 439,950	$ 22,607,124	1.74%
57	2076	$ -	$ (3,198,846)	$ 393,364	$ 19,779,035	1.74%
58	2077	$ -	$ (3,291,331)	$ 344,155	$ 16,812,080	1.74%
59	2078	$ -	$ (7,812,949)	$ 292,530	$ 9,274,849	1.74%
60	2079	$ -	$ (9,426,957)	$ 161,382	$ 0	1.74%

Kansas Electric Power Cooperative, Inc.
Estimate for Decomissioning Fund Contributions
DECON ALTERNATIVE

Decommissioning Cost Assumptions		
Total Cost DECON ALT Method in 2023 $s	**$**	**1,171,363,486**
Estimated KEPCo Cost in 2023 $s	**$**	**70,281,809**
Forecasted Rate of Inflation		**3.07%**
Remaining Years in Service		**21**
Total KEPCo Cost of Decommissioning	**$**	**182,359,030**
Market Value of Portfolio as of 6/30/2023	**$**	**36,910,973**
Remaining Balance to be Collected	**$**	**145,448,057**
KEPCo Variables		
Forecasted Return on Portfolio		**Table Below**
Annual Payment	**$**	**552,636**
Amount of Excess/Shortfall	**$**	**(0)**

Time	Year	Annual Inflow	Annual Outflow	Annual Earnings	Balance	Annual Return
1	2023	$ -	$ -	$ -	$ 36,910,973	0.00%
2	2024	$ 552,636	$ -	$ 1,903,362	$ 39,330,060	5.16%
3	2025	$ 552,636	$ -	$ 2,028,106	$ 41,871,472	5.16%
4	2026	$ 552,636	$ -	$ 2,159,157	$ 44,541,393	5.16%
5	2027	$ 552,636	$ -	$ 2,296,835	$ 47,346,323	5.16%
6	2028	$ 552,636	$ -	$ 2,441,475	$ 50,293,087	5.16%
7	2029	$ 552,636	$ -	$ 2,593,428	$ 53,388,859	5.16%
8	2030	$ 552,636	$ -	$ 2,753,066	$ 56,641,172	5.16%
9	2031	$ 552,636	$ -	$ 2,920,775	$ 60,057,942	5.16%
10	2032	$ 552,636	$ -	$ 3,096,966	$ 63,647,486	5.16%
11	2033	$ 552,636	$ -	$ 3,282,065	$ 67,418,540	5.16%
12	2034	$ 552,636	$ -	$ 3,476,524	$ 71,380,282	5.16%
13	2035	$ 552,636	$ -	$ 3,680,817	$ 75,542,355	5.16%
14	2036	$ 552,636	$ -	$ 3,895,439	$ 79,914,888	5.16%
15	2037	$ 552,636	$ -	$ 4,120,915	$ 84,508,524	5.16%
16	2038	$ 552,636	$ -	$ 4,357,792	$ 89,334,443	5.16%
17	2039	$ 552,636	$ -	$ 4,606,646	$ 94,404,392	5.16%
18	2040	$ 552,636	$ -	$ 4,868,085	$ 99,730,708	5.16%
19	2041	$ 552,636	$ -	$ 5,142,743	$ 105,326,357	5.16%
20	2042	$ 552,636	$ -	$ 5,431,290	$ 111,204,957	5.16%
21	2043	$ 552,636	$ -	$ 5,734,428	$ 117,380,816	5.16%
22	2044	$ 552,636	$ -	$ 6,052,894	$ 123,868,965	5.16%
23	2045	$ -	$ (9,161,760)	$ 6,387,464	$ 120,970,800	5.16%
24	2046	$ -	$ (20,449,182)	$ 6,238,016	$ 106,638,664	5.16%
25	2047	$ -	$ (26,386,798)	$ 5,498,961	$ 85,644,188	5.16%
26	2048	$ -	$ (28,722,447)	$ 4,416,354	$ 61,252,450	5.16%
27	2049	$ -	$ (13,742,911)	$ 3,158,562	$ 50,606,849	5.16%
28	2050	$ -	$ (7,097,517)	$ 2,609,608	$ 46,068,333	5.16%
29	2051	$ -	$ (6,341,332)	$ 2,375,573	$ 42,056,506	5.16%

30	2052	$	-	$	(2,102,583)	$	2,168,698	$	42,080,565	5.16%
31	2053	$	-	$	(1,467,468)	$	2,169,939	$	42,740,955	5.16%
32	2054	$	-	$	(1,511,012)	$	2,203,993	$	43,391,195	5.16%
33	2055	$	-	$	(1,589,530)	$	2,237,523	$	43,995,797	5.16%
34	2056	$	-	$	(1,606,271)	$	2,268,700	$	44,614,230	5.16%
35	2057	$	-	$	(1,649,667)	$	2,300,591	$	45,220,539	5.16%
36	2058	$	-	$	(1,734,839)	$	2,331,856	$	45,772,336	5.16%
37	2059	$	-	$	(1,749,206)	$	1,594,534	$	45,571,891	3.48%
38	2060	$	-	$	(1,805,965)	$	1,587,551	$	45,307,905	3.48%
39	2061	$	-	$	(1,893,649)	$	1,578,355	$	44,947,303	3.48%
40	2062	$	-	$	(1,910,056)	$	1,565,793	$	44,558,091	3.48%
41	2063	$	-	$	(1,966,941)	$	1,552,234	$	44,098,826	3.48%
42	2064	$	-	$	(2,072,553)	$	798,457	$	42,780,631	1.81%
43	2065	$	-	$	(2,085,915)	$	774,589	$	41,426,524	1.81%
44	2066	$	-	$	(2,148,111)	$	750,072	$	39,987,058	1.81%
45	2067	$	-	$	(2,256,981)	$	724,009	$	38,414,099	1.81%
46	2068	$	-	$	(2,284,190)	$	695,529	$	36,787,023	1.81%
47	2069	$	-	$	(2,393,208)	$	287,427	$	34,644,455	0.78%
48	2070	$	-	$	(2,416,277)	$	270,687	$	32,464,221	0.78%
49	2071	$	-	$	(2,488,464)	$	253,652	$	30,196,944	0.78%
50	2072	$	-	$	(2,620,104)	$	235,937	$	27,782,581	0.78%
51	2073	$	-	$	(2,639,462)	$	217,073	$	25,332,409	0.78%
52	2074	$	-	$	(2,718,408)	$	197,929	$	22,786,598	0.78%
53	2075	$	-	$	(2,854,072)	$	178,038	$	20,087,777	0.78%
54	2076	$	-	$	(2,891,145)	$	156,951	$	17,333,495	0.78%
55	2077	$	-	$	(2,969,895)	$	135,431	$	14,481,698	0.78%
56	2078	$	-	$	(7,132,459)	$	113,149	$	7,447,906	0.78%
57	2079	$	-	$	(7,498,651)	$	58,193	$	(0)	0.78%
				$	(182,359,030)			$	3,091,534,834	

KANSAS ELECTRIC POWER COOPERATIVE, INC

POLICY BULLETIN NO. 35

SUBJECT: WOLF CREEK GENERATING STATION DECOMMISSIONING FUND INVESTMENT POLICY

I. Objective

To provide guidelines to govern the investment of Kansas Electric Power Cooperative, Inc.'s (KEPCo's) Decommissioning Trust (the Trust) Fund.

II. Background

In its Order dated September 27, 1985, the Kansas Corporation Commission (KCC) required the owners of the Wolf Creek Generating Station (Wolf Creek), which includes KEPCo, to begin funding the cost of decommissioning Wolf Creek. Pursuant to the Order, KEPCo established a non-qualified grantor trust, into which KEPCo contributes its share of the decommissioning contribution. On a triennial basis, the KCC reviews and adjusts the estimated cost of decommissioning Wolf Creek, as well as the annual contributions to be made into the Trust.

III. Investment Objectives

The objective of the asset management plan is to ensure adequate funds are available for KEPCo's share of the costs associated with the full and complete decommissioning of Wolf Creek at the end of its useful life. KEPCo and the Trust's manager (Trustee), shall invest the Trust assets only in assets that are prudent investments for assets held in the Trust and in a manner designed to maximize the return on funds invested, consistent with conservation of the principal. Investments of the Trust must stay within the requirements of approved investments as established by the KCC.

IV. Investment Policy

The KEPCo Board may designate the Finance and Audit Committee, or retain an appropriate investment manager, to be responsible for the management of the Trust investments in accordance with this policy. KEPCo Staff shall monitor the performance of the Trust and report to the KEPCo Board monthly.

A. Time

Investment guidelines and asset allocations should be based on an investment horizon that corresponds to the expiration of Wolf Creek's current operating license.

B. Risk

Equity securities should occupy a dominant position in the Trust. Because the Trust is long-term in nature, tolerance to some level of risk and both short- and intermediate-term volatility is necessary to meet the long-term goals.

C. Asset Allocation

Based on the Trust's time horizon, risk tolerance, and performance expectations, the Trust's assets shall be allocated generally within the following ranges:

Equity Investments:	35%-65%
Fixed Income Securities:	35%-65%
Cash Reserves:	0%-35%

Due to market fluctuations and asset growth, securities invested in each class may need to be periodically adjusted. If adjustments are deemed necessary, this should be done within 90 days of the determination of the need for an adjustment.

By direction of the KEPCo Board Executive Committee, in response to market or other conditions, the Executive Vice President may authorize a deviation from these allocations, within KCC requirements, for up to 180 days. Deviations from these allocations for a longer period shall require approval of the KEPCo Board of Trustees.

As part of the monthly reporting to the KEPCo Board, KEPCo staff will alert the Finance and Audit Committee and/or the full KEPCo Board any time the value of the equity holdings declines more than 10% from the beginning quarterly value due to market fluctuations to determine necessary actions.

The KEPCo Board shall review and evaluate the allocations above at least annually and has the option to deviate from the ranges, within KCC requirements, due to market and other conditions.

V. Securities Requirements

A. Equities

The equity portfolio should be appropriately diversified. Except for investments in mutual funds, no more than 10% may be invested in the securities of a single issuing company, and no more than 20% may be invested in the securities of a single industry. There are no restrictions on portfolio turnover or realizing gains or losses.

The Trustee and investment manager shall not invest any portion of the Trust's funds in the securities or assets of the following:

- Any owner or operator of a nuclear power plant;
- Any index fund, mutual fund, or pooled fund in which more than fifteen percent (15%) of the assets are issued by owners or operators of nuclear power plants;
- Any affiliated company of the utility
- The Trustee or investment manager's company or affiliated companies. (This limitation does not include time or demand deposits offered through the Trustee or investment manager's affiliated banking operations.)

In addition, short sales, margin transactions, speculation in commodities, direct use of options and futures, or similar investment activities are prohibited.

B. Fixed Income

Fixed income investments, whether a direct purchase or through mutual fund investments, shall meet the following requirements:

The Trust's U.S. Government debt portfolio is to be invested in securities restricted to direct obligations of, and obligations fully guaranteed by, the U.S.A. or any agency thereof.

The Trust's mortgage- and asset-backed debt portfolio shall maintain a weighted average minimum credit quality of A. Investments in securities are restricted to, at time of purchase, a minimum credit quality of Standard & Poor's BBB or better.

The Trust's corporate debt portfolio shall maintain a weighted average minimum credit quality of A. Investments in securities shall be restricted to, at time of purchase, a minimum credit quality of Standard & Poor's BBB or better.

The Trust's corporate debt portfolio should be appropriately diversified. Except for investments in mutual funds, no more than 10% may be invested in the securities of a single issuing company and no more than 20% may be invested in the securities of a single industry.

C. Cash and Equivalents

The Trust should be fully invested at all times. However, in order to exercise prudent care against a loss of market value, it may become necessary to invest in short-term investments.

In addition to authorized investments listed elsewhere in this policy, the Trust shall restrict itself to the following categories of investments:

- Accounts at depository institutions with the balance to be maintained at or below the amount insured by the Federal Deposit Insurance Corporation (FDIC).
- Commercial Paper issued by National Rural Utilities Cooperative Finance Corporation as long as it maintains a Standard & Poor's rating of A1 or better.
- Money market mutual funds which have a net asset value that remains a constant $1 per share.

VI. Disbursement of Funds

All disbursement of decommissioning funds shall be in accordance with the Trust, KCC orders, KEPCo Board direction, and the cash flow requirements at the time of decommissioning. It is recognized that some payments may be made from time to time for trustee fees, brokerage fees, investment manager's fees, etc.

VII. Responsibility

A. The Board of Trustees shall be responsible for reviewing and making necessary changes in this policy as may be recommended or that are required by changing circumstances.

B. The Executive Vice President shall be responsible for the administration of this policy and for formulating any recommended changes in policy content which require action by the Board of Trustees.

DATE ADOPTED 9-16-21 ATTESTED _____
Secretary

ATTACHMENT 5

Financial Responsibility

Financial Responsibility

In satisfaction of this requirement, the licensee may submit existing ownership agreements together with documentation from each owner of the applicability of the agreement to the case of financial responsibility for decommissioning.

Each Owner's financial responsibility for decommissioning is found in various sections of the Ownership and Operating Agreements which are attached.

Section 4.3(e) of the Ownership Agreement states that each Owner shall at all times pay a share of all costs and expenses, including any current funding required to discharge the burden of wastes and waste fuel management, including storage, transportation, risk and liability upon and as part of decommissioning expense for each Unit in accordance with the applicable Operating Agreement in effect.

Section 4.02 of the Operating Agreement provides that the costs incurred or accrued from all sources during each calendar month in decontaminating and decommissioning the station shall be the liabilities of the Owners when incurred or accrued and shall be borne by the Owners in proportion to their Ownership Shares, defined on p. 2 as 47% KGE; 47% KCP&L; 6% KEPCO.

Section 4.04 of the Operating Agreement requires that if, and to the extent that, requirements have been or are hereafter imposed on an Owner by a federal or state authority Owner in a final order or regulation which specifies that provision be made for decommissioning costs for the Station in a particular manner or manners, such Owner will promptly take such action on its part as may be necessary to comply with such requirements.

Section 8.06 of the Operating Agreement provides that if any Owner shall be required to make any payment or incur any obligations attributable to the decontamination or decommissioning of the Station in excess of its respective Ownership Share, the other Owners shall indemnify and reimburse such Owner proportionately to their Ownership Shares to the extent of any such excess together with interest on such excess (for the period between the payment by the Owner to be so indemnified and its receipt of such indemnification).

WOLF CREEK GENERATING STATION
OWNERSHIP AGREEMENT

THIS OWNERSHIP AGREEMENT is made December 28, 1981, by and among KANSAS GAS AND ELECTRIC COMPANY ("KG&E"), a Kansas corporation having its principal office at Wichita, Kansas; KANSAS CITY POWER & LIGHT COMPANY ("KCPL"), a Missouri corporation having its principal office at Kansas City, Missouri; and KANSAS ELECTRIC POWER COOPERATIVE, INC. ("KEPCo"), a Kansas corporation having its principal office at Topeka, Kansas.

RECITALS

0.1 KG&E and KCPL are engaged in the generation, transmission, distribution and sale of electricity and KEPCo intends to become the power supplier for its member electric cooperatives in Kansas. KG&E, KCPL and KEPCo intend to own, construct and operate an electric generating station in Coffey County, Kansas, known as the Wolf Creek Generating Station ("Wolf Creek Station"), consisting initially of (i) a site for operation of electric generating units (the "Site"); (ii) a nuclear-fueled electric generating unit of approximately 1150 MWe nominal capacity ("Unit #1"); and (iii) facilities which may be used in common for operation of Unit #1 and additional generating units that may be constructed at the Site in the future (the "Common Facilities"), all to be owned by them as tenants in common, each with undivided ownership interests therein as hereinafter provided.

0.2 KG&E and KCPL, with three other electric utilities (Northern States Power Company, Union Electric Company and Rochester Gas and Electric Corporation), are participants in a program for the design, construction and licensing of standardized nuclear power plants, known as "SNUPPS" or "Standardized Nuclear Unit Power Plant System."

0.3 KG&E has caused the acquisition by Peoples National Bank and Trust Company, Burlington, Kansas (the "Trustee"), as Trustee for KG&E and KCPL, of a parcel of land in Coffey County, Kansas, for the Site.

0.4 KG&E and KCPL have, upon application to the United States Nuclear Regulatory Commission (then the Atomic Energy Commission) received a Construction Permit dated May 17, 1977, authorizing the construction of Unit #1 at the Site, which unit will be substantially of a SNUPPS' design.

0.5 KG&E has made Applications dated February 20, 1968 (No. 14626), December 19, 1972 (No. 19882) and March 1, 1973 (No. 20275) to the Division of Water Resources of the Kansas Department of Agriculture for certificated authority for appropriations of waters from Wolf Creek and the Neosho River for operation of Wolf Creek Station. Also, KG&E and KCPL have obtained a Contract dated March 13, 1976, from the Kansas State Water Resources Board for water from the John Redmond Lake (Reservoir) on the Neosho River for operation of the Wolf Creek Station.

0.6 KG&E and KCPL, together and as participants in SNUPPS, have entered into numerous contracts relating to the design, licensing, construc-

tion and equipping of Unit #1, together and as a common effort with other SNUPPS participants, including, without limitation, (i) a Contract dated February 9, 1973, with Bechtel as architect/engineer and project manager related to the design of the nuclear power block facilities for Unit #1; (ii) a Purchase Order dated February 15, 1974, with Sargent and Lundy as architect/engineer and for design and engineering as related to the balance of plant facilities and Site for Unit #1; and (iii) a Contract dated February 8, 1977, with Daniel International, Inc., through its subsidiary Daniel Construction Company, as constructor and as agent for the Owners in the construction management of Unit #1.

0.7. Contemporaneously herewith, KG&E and KCPL have by General Assignment transferred and assigned to KEPCo individual undivided interests in all permits, contracts and other rights referred to in Sections 0.4, 0.5 and 0.6 hereof, and KEPCo has by a General Acceptance adopted and agreed to be bound by the provisions of all permits, contracts and other grants related to Unit #1 to the extent of its undivided interests therein as provided in Section 1.5 hereof.

0.8 This Ownership Agreement is executed for the purposes of (i) creating and confirming the nature and extent of the respective ownership interests of KG&E, KCPL and KEPCo in the Wolf Creek Station; and (ii) imposing certain covenants and obligations running with the rights, titles and interests of KG&E, KCPL and KEPCo in and to Wolf Creek Station, which covenants and obligations are intended to inure to the benefit of and be binding upon KG&E, KCPL and KEPCo, and any and all persons whomsoever having or claiming any right, title or interest therein by, from, through or under KG&E, KCPL or KEPCo.

NOW, THEREFORE, KG&E, KCPL and KEPCo, each for itself, its successors and assigns, and for the benefit of the other, its successors and assigns, hereby covenant and agree as follows:

ARTICLE I

Creation and Adjustment of Ownership Interests

1.1 Definition of Wolf Creek Station. As used herein, the term "Wolf Creek Station" means and consists of:

(a) the lands and land rights described in Exhibit A hereto, together with all additional lands and land rights as may hereafter be acquired therefor as provided in this Section (the "Site");

(b) all site improvements and facilities at the Site (exclusive of Unit #1 as provided in Subsection (c) hereof, and exclusive of any Additional Unit as provided in Subsection (d) hereof), which are designed for joint utilization in the operation of Unit #1 and any Additional Unit or Units as may be appropriate for common use, including, without limitation, dams, cooling lakes, dam permits, water rights, water intake and discharge facilities, roads, railroad facilities, materials and supplies, control facilities, shop facilities, switchyard and substation equipment (excluding transmission line

terminations), elevators, cranes, laboratory equipment, office facilities, fuel handling facilities, together with any governmental applications, permits, appropriations, approvals and authorizations obtained in connection therewith (the "Common Facilities");

(c) Unit #1 (including all facilities and property, together with all nuclear fuel and all contracts and inventories for nuclear fuel associated with Unit #1 (the "Nuclear Fuel")) to be constructed and installed as contemplated in Sections 0.2, 0.4, 0.5 and 0.6 hereof; provided such facilities and property are for the exclusive use and operation of Unit #1;

(d) any Additional Unit constructed at the Site, including all facilities and property, together with all fuel and all fuel contracts and fuel inventories for such Additional Unit constructed at the Site, provided such facilities and property are for the exclusive use and operation of such Additional Unit;

provided that the same shall have been acquired, constructed or installed for joint or common use as a portion of Wolf Creek Station and jointly owned or leased, as permitted by Section 5.6 hereof, by the Owners for such use.

1.2 Trustee's Deed. KG&E, KCPL and KEPCo shall, from time to time, cause the Trustee to execute Trustee's Deeds conveying Wolf Creek Station, including the Site with all improvements thereon, to themselves and their successors and assigns, as tenants in common, subject to the provisions of this Ownership Agreement.

1.3 Recordations. Executed counterparts of (i) this Ownership Agreement, and (ii) the Trustee's Deed referred to in Section 1.2, shall be filed of record and recorded in the offices of the Recorder of Deeds for Coffey County, Kansas, in the order of precedence herein stated.

1.4 Initial Jointly Owned Facilities. Upon recordation of such instruments as provided for in Section 1.3, KG&E, KCPL and KEPCo shall complete initial contruction of Wolf Creek Station, including Unit #1, and all other facilities as contemplated by the Contracts referred to in Section 0.6, for their common use at Wolf Creek Station under the provisions of Section 1.1 hereof. All costs thereafter incurred in connection therewith shall be borne and paid by KG&E, KCPL and KEPCo, with funds to be provided individually by them, in proportion to their Ownership Shares as stated in Section 1.5 hereof.

1.5 Ownership Shares. At the time of the first closing, KG&E, KCPL and KEPCo shall take and receive title to and thereafter own, except to the extent that any owner's undivided interest in Nuclear Fuel has been financed as permitted by Section 5.6 hereof, Wolf Creek Station as tenants in common, each with undivided ownership interests therein as follows:

Class of Property	Ownership Interests		
	KG&E	KCPL	KEPCo
Site (at acquisition cost)	30%	30%	6%
Common Facilities (including site improvements)	30%	30%	6%
Wolf Creek Unit #1	30%	30%	6%

Because the Trustee will continue to hold legal title with respect to the remaining interests of KG&E and KCPL in the Wolf Creek Station pending subsequent closings, the foregoing table will be amended automatically to reflect the revised ownership interests specified by subsequent Trustee's Deeds. To the extent that any Owner shall finance its undivided interest in Nuclear Fuel as permitted by Section 5.6, such Owner shall for all purposes of this Agreement be considered to be the Owner of such undivided interest in Nuclear Fuel notwithstanding that an ownership interest in such undivided interest in such Nuclear Fuel has been granted to another party for such purpose. Each of such undivided ownership interests shall be subject to adjustment from time to time as provided for in Section 1.6, 1.8, 4.4 and 8.1. Such undivided percentage interests in all or portions of Wolf Creek Station are herein called "Ownership Shares." The rights, titles and interests of KG&E, KCPL and KEPCo in and to Wolf Creek Station and any and all portions hereof, as the same may exist from time to time, shall be as provided for under this Ownership Agreement, and the covenants and obligations herein shall inure to the benefit of, and shall be binding upon, their successors and assigns.

1.6 Owners. KG&E, KCPL and KEPCo each shall have the right to and may cause an adjustment of its respective Ownership Share in Wolf Creek Station (or any portion thereof as provided herein) by transfer, under Section 5.3 or 5.4, of portions of such Ownership Share pursuant to this Ownership Agreement, subject, however, to the receipt and filing of (i) a Supplemental Agreement hereto reflecting such adjustment and (ii) appropriate releases of any encumbrances thereon and compliance with the provisions of any security agreement related thereto, as contemplated in Section 5.2 hereof. Any party owning an Ownership Share in all or any portion of Wolf Creek Station is herein called an "Owner" thereof, and all such parties are herein called the "Owners."

1.7 Common Facilities. Wolf Creek Station has been designed to accommodate additional generating units on the Site ("Additional Units") with joint utilization of those facilities as may be appropriate for common use, including, without limitation, all facilities defined as Common Facilities.

1.8 Additional Units. Any Owner or Owners having in the aggregate more than fifty percent (50%) of the total Ownership Shares in Unit #1 shall have the continuing right to determine, from time to time and at any time, whether an Additional Unit will be constructed on the Site and, if so, the type of electric generating unit to be constructed, the scheduled date for completion thereof and those electric systems which will be invited to participate in ownership thereof; provided, however, that in the event such Owner or Owners having said majority of Ownership Shares in Unit #1 determine to construct such Additional Unit, then and in such event each Owner having an Ownership Share in Unit #1 shall have the right, at its own election, to participate in the ownership of such Additional Unit with an undivided percentage interest therein up to, but not in excess of, its then Ownership Share in Unit #1, except by mutual agreement of all Owners of the total Ownership Shares in Unit #1. The agreed Owners of an Additional Unit shall have the right, upon terms and conditions mutually agreeable to each of them, to cause or permit (i) the construction and operation of such Additional Unit and all facilities related thereto on the Site, and (ii) the relocation or modification of any of the facilities and property then included in Wolf Creek Station and any solely owned facilities then located on the Site as provided in

Article II, for construction and operation of any such Additional Unit and its related facilities; provided (a) that such construction and operation will not unreasonably interfere with or materially impair the use of the facilities and property then included in Wolf Creek Station or otherwise located on the Site, (b) that any agreed adjustment of the Ownership Shares in the Common Facilities and the Site will be reflected as capital transactions, subject to compliance with the applicable provisions of any related security agreement contemplated in Section 5.2 hereof, and (c) that all other costs thereof, including any such relocation or modification costs, are borne by the Owners of such Additional Unit. The proportional adjustments to be made in such undivided Ownership Shares in the Common Facilities and the Site shall be made prior to commencement of construction of any Additional Unit and shall be reflected by purchases and sales (at the depreciated original cost thereof to the selling Owner, including all gross allowances for funds used during construction properly recorded on the books of such seller) of such portions thereof as will adjust the Ownership Shares of the Common Facilities and the Site of all Owners of Wolf Creek Station, including the Owners of such Additional Unit, in proportion to their ownership interests in the total gross capacity, as related to the initial net accredited capacity, of all Units including the nominal gross capacity of the Additional Unit to be constructed. It is intended that the Common Facilities for Unit #1 will not include any of the facilities that are exclusively for any Additional Unit at Wolf Creek Station. For the purpose of calculating any revision of the weighted percentage Ownership Shares of the Owners in the Common Facilities, the allocation of Common Facilities among Units shall be made on the basis of the relation of any Common Facility to a particular Unit or Units as agreed among the Owners. Common Facilities that have no relation to a particular Unit will not be allocated to the Owners of such Unit based upon their Ownership Shares therein. For the purposes of allocating Common Facilities, all Ownership Shares and ownership interest calculations based on capacity shall be made using "nominal gross capacity".

ARTICLE II

Easements for Interconnection Facilities

2.1 Interconnection Facilities. Each Owner shall have the right to install, own, operate, and maintain, at its own costs and expense, at, on, along, over, under and across the Site such facilities as are reasonably required (i) to enable it to deliver to its own system the electric power and energy which it is entitled to receive from any Unit at Wolf Creek Station, (ii) to establish interconnections between its system and the systems of others, and (iii) to connect separated portions of its own system facilities, provided that such solely owned facilities shall be so installed, operated and maintained as not unreasonably to interfere with or materially impair the use of any then existing facilities located on the Site or the ultimate full utilization thereof. Interconnection Facilities are not to be considered part of the Wolf Creek Station.

2.2 Relocations and Modifications. In the event an Owner proposes to install and operate any such solely owned facilities hereunder which would require the relocation or modification of any then existing facilities located on the Site but would otherwise meet the requirements of this Agreement,

such Owner shall have the right to cause such relocation or modification, provided it bears the cost thereof.

2.3 Personal Property. All solely owned facilities, including transmission lines and terminations, installed pursuant to the provisions of this Article shall be and remain the sole property of the Owner installing them; shall not be a portion of Wolf Creek Station under Section 1.1 hereof; shall, where practicable, be identified by distinctive marking as the property of such Owner, and shall be deemed and considered to be personal property in which such Owner has reserved the right to remove the same at any time.

2.4 Exclusive Right, Title and Interest. No provision hereof shall give to any other Owner or anyone claiming by, from, through or under such other Owner any right, title or interest in any such solely owned facilities permitted by Section 2.1 hereof.

ARTICLE III

Management and Operation of Wolf Creek Station

3.1 Common Facilities Committee. Except as provided in Subsection 3.7(c) hereof, all policies relating to the management and operation of the Common Facilities and the Site shall be determined by a Common Facilities Committee consisting of two representatives of each Owner thereof. The chief executive officer of each such Owner shall designate, from time to time, its two representative members to serve on the Common Facilities Committee, at least one of whom shall be a corporate officer of such Owner. Such designation shall be by written notice to the other Owners thereof. Such management and operation of the Common Facilities and the Site shall be consistent with the provisions of this Ownership Agreement.

3.2 Management Committee. Except as provided in Subsection 3.7(c) hereof, all policies relating to the management and operation of any Unit (including fuel for such Unit) shall be determined by a Management Committee therefor consisting of two representatives of each Owner thereof. An Owner's representative members on the Common Facilities Committee shall serve as its representative members on such Management Committee. Such management and operation of each Unit shall be consistent with the provisions of this Ownership Agreement.

3.3 Committee Action. Each Owner shall have a vote on each such Committee equal to its Ownership Shares in the property to be managed by such Committee. Actions by any Committee shall require a majority vote of the undivided Ownership Shares except as stated in Section 3.5(a). No Committee shall have authority to modify any provision of this Ownership Agreement.

3.4 Property Additions and Retirements.

(a) The Common Facilities Committee and each Management Committee shall cause to be made such significant property additions to and removals or retirements from the facilities and property

constituting the Site, the Common Facilities and each Unit, respectively, as may, from time to time, be deemed by such Committee to be necessary or desirable.

(b) Each Owner of the Site, the Common Facilities or any Unit shall pay for the cost of any such property addition thereto in the same percentage as its Ownership Share therein, and the rights, titles and interests of any Owner in and to any such property addition shall be proportionate to its Ownership Share therein.

(c) Upon such removal or retirement of any facilities or property included in any portion of Wolf Creek Station and subject to compliance with the applicable provisions of any related security agreement contemplated in Section 5.2 hereof, the Owners thereof may, at their option and notwithstanding the provisions of Section 5.1 hereof, (i) divide or partition such removed or retired facilities or property, or (ii) sell or otherwise dispose of such removed or retired facilities or property and distribute the proceeds thereof to or for the account of each Owner thereof in accordance with its Ownership Share therein.

3.5 Destruction, Damage or Condemnation.

(a) If more than half of Wolf Creek Station or any Unit should be destroyed, damaged or condemned, the Owners thereof by unanimous agreement may elect to repair, restore or reconstruct the damaged, destroyed or condemned facilities in such manner as such Owners may then mutually agree. In the event of such election, it shall be the obligation of such Owners to pay for the costs thereof in accordance with their respective Ownership Shares therein, and, upon completion thereof, such Owners' rights, titles and interests therein shall be as provided under this Ownership Agreement.

(b) In the event such Owners fail to agree as provided in Subsection (a) above, a majority interest of the Ownership Shares in any such Unit may elect in writing to repair, restore or reconstruct the damaged, destroyed, or condemned facilities and the Owners of such majority interest shall thereupon have the right to purchase the minority Ownership Shares in such Unit, together with the related proportionate Ownership Shares of the minority interest in the Common Facilities and Site at a cost not to exceed the salvage or remaining value thereof.

(c) In the event that such Owners do not proceed as provided in Subsection (a) or (b) above, such failure shall be deemed to be an election not to repair, restore or reconstruct the damaged, destroyed or condemned facilities, in which event the proceeds from any insurance policy or condemnation award shall be distributed to or for the account of such Owners in accordance with their respective Ownership Shares therein, and the remaining facilities shall be disposed of by such Owners in a manner as may then be

mutually agreed by them and the proceeds therefrom shall be distributed to or for the account of such Owners in accordance with their Ownership Shares therein, all subject to the liens of any encumbrance and the provisions of any related security agreement contemplated in Section 5.2 hereof.

(d) In the event that less than half of any Unit shall be damaged, destroyed or condemned, then it shall be the obligation of the Owners thereof to repair, restore or reconstruct the damaged, destroyed, or condemned facilities and to pay for the same as provided in Subsection (a).

3.6 Requirements of Mortgage Indentures. Each Owner may take such action in regard to its Ownership Share in any portion of Wolf Creek Station (including any fuel) as may be necessary to comply with any provision (i) of any existing deed of trust, mortgage indenture or other security agreement of such Owner, or (ii) which, with respect to any future deed of trust, mortgage indenture or other security agreement of such Owner, is or would be required to qualify a trust indenture under the Trust Indenture Act of 1939, as amended (15 U.S.C. 77aaa et seq.) and the General Rules and Regulations thereunder (17 C.F.R. 260), including, without limitation, provisions relating to standards of maintenance, absence of liens, payment of taxes and governmental charges, compliance with governmental regulations, insurance coverage, and the like; provided that any such action by one Owner shall not effect a default by another Owner under the provisions of any then existing security agreement of the other Owner. The Common Facilities Committee or the appropriate Management Committee shall take such action relating to the operation and maintenance of the Common Facilities or any Unit as any Owner of an Ownership Share therein shall advise, in writing, is necessary for such Owner to comply with the provisions of any such existing or future deed of trust, mortgage indenture or security agreement to which it is a party and the costs therefor shall, unless otherwise provided in the applicable Operating Agreement, be borne by the Owners of such portion of Wolf Creek Station in proportion to their Ownership Shares therein.

3.7 Operating Agent.

(a) Each Owner of the Site, Common Facilities and each Unit hereby authorizes KG&E to act as its agent to perform, as an Operating Agent, through KG&E's own employees, agents, servants and contractors, all functions as may be required for the actual operation and maintenance of the Site, Common Facilities and each Unit, including fuel therefor, subject, however, to the policies established by the Common Facilities Committee and the Management Committee for each Unit, respectively; provided, however, that KG&E shall not be liable to any other Owner for any loss, cost, damage or expense incurred by such Owner as a result of any action or failure to act by KG&E, as Operating Agent, in respect to its operation and maintenance of the Site, Common Facilities or Unit, unless KG&E's action or failure to act was not in good faith and was prejudicial to such Owner for the benefit of KG&E.

(b) The Operating Agent shall have full power and authority to act in all matters related to the operation and maintenance of the Site, Common Facilities and each Unit (including fuel therefor) and shall be required to secure appropriate Committee approval with respect only to those policy matters which are clearly beyond the normal course of operation or maintenance.

(c) Notwithstanding any other provision of this Agreement, the Operating Agent shall perform any and all actions duly required by the Nuclear Regulatory Commission or any other regulatory body having jurisdiction over the operation and maintenance of Wolf Creek Station.

(d) Upon written notice to KG&E, the other Owner with the greatest percentage ownership interest in the Site may, at its option, forthwith become, and assume the duties of, Operating Agent hereunder in the stead of KG&E if at such time (i) KG&E has been finally adjudged a bankrupt, or KG&E's Ownership Share in Wolf Creek Station has been seized and is held by any governmental authority having jurisdiction provided that KG&E shall be reinstated upon final termination of the proceedings and it recovers its Ownership Share in Wolf Creek Station, and (ii) such other Owner is not bankrupt and its Ownership Share in Wolf Creek Station has not been seized by any governmental authority.

(e) Contracts covering design, engineering, procurement, construction and installation services and major components of Units and all other contracts relating to procurement, operation and maintenance, including contracts for the acquisition of materials, inventories, supplies, spare parts, equipment, fuel or services therefor, may be executed solely by the Operating Agent or at its request shall be executed by each Owner. Whether or not a contract is entered into in the name of all Owners, each Owner shall be severally and not jointly responsible for its percentage of the amounts which are payable thereunder and all performance with respect to such contracts in proportion to its Ownership share therein. The Operating Agent is expressly authorized to execute all contracts as agent on behalf of each of the Owners. Each contract entered into in the name of all Owners shall provide for several, but not joint, liability in proportion to each Owner's respective percentage Ownership Share therein, and at the Operating Agent's determination, may provide for separate invoicing to each Owner in accordance with its respective percentage Ownership Share thereof.

3.8 Operating Agreements. The Owners of the Common Facilities and the Owners of each Unit shall, by and through agreements among themselves, enter into Operating Agreements for the purpose of establishing with respect thereto more detailed provisions and procedures to implement the provisions of this Ownership Agreement. If an Owner of any portion of Wolf Creek Station shall transfer, under the provisions of Section 5.3 or 5.4, all or any portion of its Ownership Share therein, such Owner shall assign, and shall cause its transferee to assume, the related portion of its rights and obligations under the Operating Agreement applicable thereto. No assignment of any rights or

obligations under an Operating Agreement shall be made except in connection with a transfer of an Ownership Share hereunder. In any instance of conflict between this Ownership Agreement and any other contract or agreement, including any Operating Agreement, the provisions hereof shall take precedence and shall govern.

ARTICLE IV

Capacity and Energy Entitlement and Financial Obligations

4.1 Capacity Entitlement. Subject to the provisions of Section 4.4, each Owner shall be entitled at all times to the then effective maximum operable capability of a Unit (as then permitted by law) in proportion to its Ownership Share in such Unit at such time, and it hereby waives any and all right to any capacity in excess of such pro rata capability.

4.2 Energy Entitlement. Subject to the provisions of Section 4.4, each Owner of a Unit, at all times, (a) shall be entitled to schedule and have the right to receive energy from such Unit at a rate not in excess of that portion of the then maximum operable capability of such Unit (but not in excess of that then permitted by law), and (b) if requested by any other Owner, shall schedule energy from such Unit at a rate not less than that portion of the minimum operable capability of such Unit (but not less than that permitted by law), which is proportional to its Ownership Share in such Unit at such time, each as measured on the basis of net output on the generator side of the step-up substation bus for such Unit.

4.3 Financial Obligations. Each Owner shall at all times pay

(a) a share corresponding to its then Ownership Share in the Site of all expenditures for the lands and land rights described in Exhibit A hereto, together with all additional lands and land rights as may hereafter be acquired therefor;

(b) a share corresponding to its then Ownership Share in Common Facilities of all expenditures for construction, operation and maintenance of Common Facilities and for renewals, replacements, additions and retirements in respect thereof;

(c) a share corresponding to its then Ownership Share in each Unit of all expenditures (other than those in respect to Common Facilities) for construction, operation and maintenance (excluding variable costs, including those associated with fuel use, as provided in the applicable Operating Agreement) of such Unit and for renewals, replacements, additions and retirements in respect thereof;

(d) a share of all expenditures in respect to fuel used (and other variable generating costs as provided in the applicable Operating Agreement) for each Unit corresponding to the ratio of the energy taken by it from such Unit to the total energy taken by the Owners of such Unit, as provided in the applicable Operating Agreement; and

(e) a share of all costs and expenses, including any current funding required to discharge the burden of wastes and waste fuel management, including storage, transportation, risk and liability upon and as part of decommissioning expense for each Unit in accordance with the applicable Operating Agreement in effect.

For the purposes of this Section, expenditures shall not be deemed to include (i) interest charges on borrowed funds, income taxes, and property, business and occupation taxes of each Owner, which shall be borne entirely by such Owner, and (ii) depreciation, amortization and allowances for funds used during construction.

4.4 Default.

(a) If prior to the date of commercial operation of Unit #1 or any Additional Unit an Owner thereof shall (a) be in default of any obligation hereunder for a period of 10 days or more after notice thereof by any other Owner, or (b) fail or be unable, for any reason whatsoever, to make any payment within 30 days of the date due for or on account of the construction of Wolf Creek Station, or (c) shall admit in writing its inability to pay its debts generally as they become due or shall file a petition in voluntary bankruptcy or shall make a general assignment for the benefit of its creditors, or shall consent to the appointment of a receiver for the whole or any part of its utility assets; or shall be adjudicated a bankrupt or insolvent; or an order, judgment or decree shall be entered by any court of competent jurisdiction appointing, without such Owner's consent, a receiver for the whole or any substantial part of its assets and such adjudication order, judgment or decree shall not be vacated or set aside or stayed within 90 days after the entry thereof, or (d) has been declared in default under any mortage, deed of trust, or other instrument under which a lien or other security interest has been granted or acquired in such Owner's ownership interests in Wolf Creek Station, then such Owner shall be deemed to be in default hereunder and the nondefaulting Owner or Owners thereof may, by written notice to the defaulting Owner, but without relieving any defaulting Owner of its liability for the default, (i) agree to complete or cause the completion of construction of the Unit without additional payments by the defaulting Owner and (ii) limit the defaulting Owner's ownership interests in the Unit, Site and Common Facilities at Wolf Creek Station to those percentages thereof as are equal to the ratio of the payments theretofore made by the defaulting Owner to the total construction expenditures of the Owners therefor, exclusive of any allowance for funds used during construction, in which event the defaulting Owner's ownership interests in the Unit, Site and Common Facilities at Wolf Creek Station shall reduce automatically and concurrently as and to the extent that additional construction expenditures (exclusive of any allowance for funds used during construction) are paid by or for the account of the nondefaulting Owner or Owners for completion thereof; provided, however, that upon completion thereof the defaulting Owner shall remain subject to the provisions of Sections 4.1, 4.2, 4.3 and 4.4 hereof with respect to its reduced Ownership Share therein; and provided further, that to the extent

that any Owner's interest in Nuclear Fuel is the subject of a financing arrangement permitted under Section 5.6 hereof, no reduction in such Owner's interest in Nuclear Fuel subject to such financing arrangement shall be made. Subject to the foregoing, in any such event, the respective ownership interests of the Owners in the Unit, Site and Common Facilities at Wolf Creek Station shall adjust automatically and proportionately to reflect the defaulting Owner's decreasing ownership interests therein and the non-defaulting Owners' increasing ownership interests as and to the extent that additional construction expenditures are made or caused to be made by each nondefaulting Owner for completion thereof.

(b) If subsequent to the date of commercial operation of Unit #1 or any Additional Unit an event of default by any Owner occurs in the payment of all or any part of its share of any expenditures as provided in Section 4.3, such Owner shall not be entitled to schedule or receive any energy from any such Unit during the continuance thereof if such default is not cured within five (5) days after delivery of written notice of such default by any other Owner; and during the remaining period of any such default the nondefaulting Owners of each Unit in which such Owner has an Ownership Share therein shall be entitled (without relieving the defaulting Owner of its liability for the default) to schedule and receive all the energy capable of being produced by such Unit (including the capacity entitlement of the defaulting Owner) in proportion to their respective Ownership Shares therein. Further, if any Owner defaults in its obligation to pay its proportionate share of capital additions, betterments or improvements, then the Ownership Shares of such defaulting Owner in any appropriate Unit and/or Common Facilities shall be subject to automatic reduction as specified and provided in Section 4.4(a).

(c) Nothing in Sections 4.4(a) or 4.4(b) is intended to relieve, or shall relieve, a defaulting Owner of its liability for the default, and the exercise by the nondefaulting Owner or Owners of any rights provided for in this Section 4.4 (including rights which reduce the Ownership Shares of the defaulting Owner or permit the nondefaulting Owner or Owners to use the capacity entitlement of the defaulting Owner) shall be considered in mitigation of damages due the nondefaulting Owner or Owners for which the defaulting Owner shall be and remain liable until paid, together with interest thereon at a rate equal to 125 percent of each nondefaulting Owner's gross rate of accrual of (i) an allowance for funds used during construction (AFDC), (ii) interest during construction (IDC), or (iii) other similar cost components regularly used by such nondefaulting Owner, each as applicable during such periods.

4.5 Interchange. Except as otherwise provided in Section 4.4, the capacity entitlement of Owner shall not be available for use by another Owner unless the entitled Owner desires to sell and the other Owner desires to buy any excess capacity entitlement of the selling Owner. Any such sale shall be in accordance with applicable service schedules for interchange transactions between such Owners as may be in effect from time to time and on file with the appropriate regulatory authorities.

ARTICLE V

Partition - Encumbrance - Transfer

5.1 Partition. The Owners and their successors and assigns hereby waive their respective rights with respect to the partition of Wolf Creek Station and any portion thereof for a period of time ending with the abandonment of the use thereof for the generation, transmission or distribution of electricity. No Owner of any Ownership Share in Wolf Creek Station or any portion thereof shall take or resort to any action or permit any action to be taken in its name (including, without limitation, any court proceeding at law or in equity) for the purpose of or which might result in a partition of Wolf Creek Station or any portion thereof (including without limitation, the Site, Common Facilities, any Unit, Nuclear Fuel and all additions and improvements thereto and replacements thereof). Each such Owner, for itself and its successors and assigns, hereby releases all partition rights in respect thereof, whether now existing or hereafter accruing, whether under common law or statute, and whether in kind or otherwise, and each such Owner thereof shall from time to time, upon written request by any other Owner of an Ownership Share therein, execute and deliver such further instruments as may be necessary or appropriate to confirm the foregoing waiver and release of partition rights.

5.2 Encumbrance. Each Owner and its successors and assigns, of Wolf Creek Station or any portion thereof shall have the right to and may encumber its Ownership Share therein (subject to the provisions of this Ownership Agreement) by any deed of trust, mortgage indenture or other security agreement, whether now existing or hereafter created as security for its present or future bonds or other obligations or securities, without the prior consent of any other Owner, and any trustee or secured party thereunder, when acting pursuant to the provisions thereof, shall have the benefit of, and may require and enforce performance of, the covenants and obligations herein and may exercise all rights and powers of such Owner under this Ownership Agreement and the applicable Operating Agreement as the same may then be in effect.

5.3 Transfer. No Owner of Wolf Creek Station or any portion thereof shall have the right, without the prior written consent of all other Owners of such portion of Wolf Creek Station, to sell, transfer, or assign any right, title or interest in, or create any lien or encumbrance on, all or any part of the facilities and property represented by its Ownership Share therein, except that no consent shall be required for an Owner (i) to encumber such Ownership Share as provided in Sections 5.2, 5.5 and 5.6, or (ii) to transfer such Ownership Share to another corporation (whether or not affiliated with such Owner) together with all or substantially all of its other utility property, whether by sale or pursuant to or as a result of a merger, consolidation, liquidation or corporate reorganization, provided that such corporation by written agreement or by operation of law assumes the obligations hereunder of the Owner transferring such Ownership Share, or (iii) to transfer an undivided Ownership Share to the Kansas Municipal Energy Agency, or (iv) to the United States of America (the "USA") by KEPCo pursuant to the provisions of KEPCo's loan agreements with the USA, provided that any subsequent transfer by the USA, except to retransfer to KEPCo, shall be subject to the provisions of Section 5.4 hereof, or (v) to

transfer such Ownership Share or any portion thereof pursuant to the provisions of Section 5.4 hereof.

5.4 Right of First Refusal.

(a) Except with respect to transfers permitted under Section 5.3 and transfers permitted under Sections 5.5 and 5.6 by an Owner to initiate and continue the financing arrangements contemplated thereby, should any Owner desire to sell, transfer, assign, convey or otherwise dispose of its Ownership Share or any part thereof in Wolf Creek Station or any portion thereof (the "Transfer Share") to any other entity or agency whatsoever including any other Owner of an Ownership Share therein (the "Proposed Transferee"), the other Owners of Ownership Shares therein (the "Remaining Owners") shall have rights of first refusal, as provided in this Section, to purchase such Transfer Share, and such Owner shall not dispose of such Transfer Share except as provided in this Section.

(b) At least one year prior to its intended date to so dispose of its Transfer Share, and after receipt by it of a bona fide written offer, which it desires to accept, from the Proposed Transferee (who shall be a buyer ready, willing and able to purchase the Transfer Share upon expiration of the notice periods specified in this Section), the Owner desiring to dispose of its Transfer Share shall serve a written Notice of Intent to Transfer upon the Remaining Owners. Such Notice shall contain the approximate proposed date of disposition of such Transfer Share, the terms and conditions of said bona fide written offer received by such Owner from the Proposed Transferee, and the terms and conditions under which such Owner would sell such Transfer Share to the Remaining Owners (including, without limitation, the right to purchase for cash), which shall be at least as favorable to the Remaining Owners as the terms and conditions offered by the Proposed Transferee.

(c) Each Remaining Owner desiring to purchase all or any portion of such Transfer Share shall signify such desire by serving written Notice of Intent to Purchase upon the Owner desiring to dispose of such Transfer Share and the other Remaining Owners within One Hundred Twenty (120) days after receipt of Notice of Intent to Transfer under Subsection (b).

(d) If the Remaining Owners signify their intention under Subsection (c) to purchase in the aggregate more than the entire Transfer Share, then each such Remaining Owner shall have the right to purchase (i) a portion of the Transfer Share not in excess of the ratio of its Ownership Share to aggregate Ownership Shares of the Remaining Owners who have served a Notice of Intent to Purchase under Subsection (c), plus (ii) a similar proportionate share of the Transfer Share which other Remaining Owners elect not to purchase.

(e) If in their Notices of Intent to Purchase served under Subsection (c) the Remaining Owners should signify an intention to

purchase less than the entire Transfer Share, the Remaining Owners shall have an additional sixty (60) days after receipt of the last Notice of Intent to Purchase under Subsection (c) to resignify their intention to purchase the entire Transfer Share in accordance with Subsection (d).

(f) If and when intention to purchase the entire Transfer Share has been signified by written Notices of Intent to Purchase from the Remaining Owners, disposal of such Transfer Share shall be effected by the Owner thereof to the Remaining Owners in accordance with their respective Notices of Intent to Purchase, subject to all required governmental regulatory approvals thereof, and release of any liens imposed thereon by or through the Owner thereof.

(g) If the Remaining Owners have failed to signify (by proper Notices of Intent to Purchase as provided hereunder) their intention to purchase the entire Transfer Share, the Owner thereof shall be free to dispose of such Transfer Share to the Proposed Transferee upon the terms and conditions stated in its bona fide written offer.

(h) Any disposition of a Transfer Share hereunder, whether to any Remaining Owner or Owners or to any Proposed Transferee, shall be made subject to all of the benefits and burdens of the covenants and obligations applicable thereto as provided in this Ownership Agreement. Any such Proposed Transferee shall upon receipt of transfer assume and agree, in writing, delivered to the other Owners thereof, to perform the provisions of this Ownership Agreement and the applicable Operating Agreements.

5.5 Environmental Control Financing. Insofar as may be appropriate or required for the issuance of tax-exempt environmental or pollution control financings pursuant to regulations by the Internal Revenue Service and the laws of the State of Kansas as the same may be amended from time to time, each of the Owners may individually sell, convey or grant estates in its undivided interests in such environmental or pollution control facilities and non-exclusive licenses, easements and rights-of-way over, across, through and under Wolf Creek Station for the purposes of locating and maintaining such facilities on Wolf Creek Station and providing such rights of access to such facilities as may be necessary for inspection during the term of any such financing; provided, however, that no such conveyance, license, easement or right-of-way shall (i) grant or purport to grant any right to operate or remove any of the machinery, equipment, buildings, structures or facilities constituting a part of Wolf Creek Station, or (ii) unreasonably interfere with or materially impair the use of any then existing facilities located on the site. Each Owner will do all acts necessary to assure and perpetuate the ability of other Owners of Wolf Creek Station to cause to be issued tax exempt bonds for purpose of financing the pollution control installations at Wolf Creek Station.

5.6 Nuclear Fuel Financing. Insofar as may be appropriate or required in connection with nuclear fuel financing, each of the Owners may individually sell, convey or grant estates in its undivided interest in such Nuclear Fuel

for use at Wolf Creek Station, and grant nonexclusive licenses, easements and right-of-ways over, across, through and under Wolf Creek Station and enter into such agreements (lease, sale, or other possessory transfers) as may be required for such nuclear fuel financing; provided, however, that no such estate, nonexclusive license, easement, right-of-way or agreement shall grant or purport to grant any right to possess, operate or remove or unreasonably interfere with or impair the use of any of the Nuclear Fuel, machinery, equipment, buildings, structures or facilities constituting a part of the Wolf Creek Station. Each Owner will cooperate fully with the other Owners of Wolf Creek Station to facilitate Nuclear Fuel Financing arrangements.

ARTICLE VI

Covenants and Obligations

6.1 Equitable Servitudes. The respective covenants and obligations of the Owners of Wolf Creek Station and any portion thereof under this Ownership Agreement are intended to be in the nature of equitable servitudes (not liens) which shall run with the respective rights, titles and interests of their Ownership Shares therein, and be for the benefit of and be binding upon any and all persons whomsoever having or claiming any right, title or interest in or to Wolf Creek Station or any portion thereof by, from, through or under KG&E, KCPL or KEPCo or their successors or assigns.

6.2 Independent Covenants and Obligations. The covenants and obligations contained in this Ownership Agreement are to be deemed to be independent covenants, not dependent covenants, and the obligation of any Owner to keep and perform all of the covenants and obligations assumed by or imposed upon it hereunder is not conditioned upon the performance by any other Owner of all or any of the covenants and obligations to be kept and performed by it.

6.3 Several Obligations. The obligations and liabilities of the Owners are intended to be several and not joint or collective, and nothing herein contained shall be construed to create an association, joint venture, trust or partnership. Each Owner shall be individually responsible for the performance of its own obligations herein provided. No Owner shall have a right or power to bind any other Owner without its express written consent, except as expressly provided in this Ownership Agreement or the applicable Operating Agreement.

6.4 Liability. All risk, loss and damage arising out of the ownership, construction, operation, maintenance or decommissioning of any portion of Wolf Creek Station (including fuel) will be borne by the Owners thereof in proportion to the percentage ownership interest therein, portions of which may be insured at costs to be shared proportionately by them. If insured, the Owners thereof shall be named insureds as their respective interests may appear, with subrogation rights waived. If any Owner, by reason of joint liability, shall be called upon to make any payment or incur any obligation in excess of its proportionate Ownership Share therein, the other Owners thereof shall indemnify and reimburse such Owner proportionately to the extent of any such excess.

6.5 IRS Election. By the date fuel loading of Unit 1 has commenced, the Owners shall have elected to be excluded from the application of Subchapter "K" of Chapter 1 of Subtitle "A" of the Internal Revenue Code of 1954, or such portion or portions thereof as may be permitted or authorized by the Secretary of the Treasury or his delegate insofar as such subchapter or any portion or portions thereof may be applicable to the Owners under this Agreement, or any similar provisions of the Internal Revenue Code in effect from time to time as may be appropriate to exempt the Owners from the filing of a partnership return with respect to Wolf Creek Station.

ARTICLE VII

Arbitration

7.1 Controversies. Any controversy between or among Owners of Wolf Creek Station or any portion thereof arising out of or relating to this Ownership Agreement, or any breach hereof or default hereunder, shall be submitted to arbitration upon the request of any such Owner in the manner provided herein.

7.2 Notice to Arbitrate. The Owner submitting a request for arbitration shall serve a Notice to Arbitrate upon the other Owner or Owners directly involved setting forth in detail the matter or matters to be arbitrated, including a statement of the facts or circumstances giving rise to such controversy and such Owner's contention with respect to the correct determination thereof.

7.3 Selection of Arbitrator. If the Owners directly involved in such controversy are unable to agree upon and appoint, within 15 days of the date of service of the Notice to Arbitrate, one person to act as sole arbitrator, such Owners, or any one of them, shall within 10 days thereafter request the Chief Judge of the United States Court of Appeals for the Tenth Circuit (or such successor thereto as might have Federal appellate jurisdiction of matters arising in Coffey County, Kansas) to appoint such arbitrator. If the Chief Judge does not appoint an arbitrator within 15 days of the date such request is made of him, such Owners, or any one of them, shall, within the next 10 days thereafter, request the American Arbitration Association (or comparable organization) to appoint the arbitrator pursuant to its then existing rules.

7.4 Scope of Arbitration. Any arbitrator serving hereunder shall give full force and effect to all provisions of this Ownership Agreement and any Operating Agreement applicable to Site, the Common Facilities or a Unit as may be involved, shall hear evidence submitted by the respective Owners, and may call for additional information, which additional information shall be furnished by the Owner having such information.

7.5 Findings and Award. The findings and award of the arbitrator shall be binding and conclusive with respect to the matter or matters submitted to arbitration, except as the same may be set aside, modified or corrected by any court in accordance with Kansas law.

7.6 Costs. The fees and expenses of the arbitrator shall be borne equally by the Owners directly involved in such arbitration, unless the decision of the arbitrator shall specify some other apportionment of such fees

and expenses. All other expenses and costs of the arbitration shall be borne by the Owner incurring the same.

ARTICLE VIII

General Provisions

8.1 Implementing and Confirmatory Instruments. Each Owner shall execute, or cause to be executed, such instruments as may from time to time reasonably be requested by any other Owner to implement the provisions of the Ownership Agreement, including, without limitation, instruments of conveyance, transfer, and mortgage release to confirm the effective Ownership Shares in the facilities and property which then constitute Wolf Creek Station or any portion thereof. It is expressly understood that changes in ownership interests pursuant to Section 4.4 will be confirmed as provided herein without undue delay and the obligation of a defaulting Owner to execute confirmatory instruments may be enforced by specific performance in an appropriate legal or equitable forum.

8.2 Waivers. No waiver by an Owner of its rights with respect to a default under this Ownership Agreement shall be effective unless all non-defaulting Owners waive their respective rights. Any such waiver shall not be deemed to be a waiver with respect to any subsequent default or matter. No delay short of the statutory period of limitations in asserting or imposing any right hereunder shall be deemed a waiver of such right.

8.3 Notices. Any notice, demand, request or consent provided for in this Ownership Agreement or made in connection herewith shall be deemed properly served if given in writing and delivered in person, or sent by Registered or Certified Mail, postage prepaid, addressed to, the President of the Owner at its then principal office.

8.4 Severability. In the event any provision hereof or the application thereof to any person or circumstance shall be held invalid in any final decision by a court having jurisdiction in the premises, the remainder of this Ownership Agreement and its application to persons or circumstances other than those as to which it was held invalid shall not be affected thereby.

8.5 Governing Law. The validity, interpretation and performance of this Agreement and each of its provisions shall be governed by the laws of the State of Kansas, including without limitation the provisions of K.S.A. 16-116 and any amendments thereto.

ARTICLE IX

Term - Termination

9.1 Effective Date and Term. This Ownership Agreement shall become effective upon execution hereof by KG&E, KCPL and KEPCo and shall continue in full force and effect thereafter until terminated as provided in Sections 9.2 and 9.3.

9.2 Termination. Except as provided in Section 9.3, this Ownership Agreement shall terminate and be of no further force and effect from and after the date

(i) the Owners of Wolf Creek Station shall file of record in the office of the Recorder of Deeds for Coffey County, Kansas, (or such other office as may then serve such function) a duly executed Termination Agreement terminating this Ownership Agreement and discharging the rights, titles and interests of such Owners in and to Wolf Creek Station from the benefits and burdens of the covenants and obligations herein; provided that Wolf Creek Station shall have been released from the liens of all encumbrances contemplated by Section 5.2 hereof and such releases shall have been duly filed of record prior to recording of such Termination Agreement; or

(ii) an Owner shall acquire by transfer hereunder or by operation of law all Ownership Shares in Wolf Creek Station and, as a result of the merger of such undivided percentage interests therein, becomes the sole beneficial Owner of all rights, titles and interests therein; or

(iii) there has been an abandonment of the use of Wolf Creek Station for the generation and transmission of electricity as evidenced by an Affidavit of Abandonment duly executed by an Owner of any portion thereof, filed of record as provided in Part (i) above, and thereafter published in a newspaper of general circulation in Coffey County, Kansas, with written notice thereof delivered to the other Owners within ten (10) days after the recording of such Affidavit, unless another Owner of any portion thereof denies such abandonment by an Affidavit of Non-abandonment similarly filed of record within sixty (60) days after publication of such Affidavit of Abandonment;

whichever date is earlier.

9.3 Disposition Upon Abandonment. In the event this Ownership Agreement is terminated by Affidavit of Abandonment as provided in Section 9.2(iii), the Owner executing the Affidavit of Abandonment shall have the right to dispose of all the facilities and property then included in Wolf Creek Station (provided such facilities and property to be disposed of are not then subject to the lien of any encumbrance, or such disposition is otherwise made in accordance with the terms of any related security agreement, contemplated in Section 5.2 hereof), shall pay, or make provision for the payment of, all decommissioning costs and expenses as may then be required by law and thereafter shall dispose thereof as promptly as practicable and distribute the net proceeds thereof, if any, to the Owners, or to lienholders for the account of the Owners, in accordance with their respective Ownership Shares therein; provided, however, that if any determinable portion of such proceeds is received from facilities or property the cost of which was borne by the Owners disproportionately to their Ownership Shares therein, the distribution of such proceeds shall be adjusted accordingly; and provided further, that termination of this Ownership Agreement shall not discharge any Owner of

any obligation it then owes to any other Owner as a result of any transaction occurring prior to such termination.

IN WITNESS WHEREOF, the parties hereto have caused this Ownership Agreement to be executed by their duly authorized officers the day and year first above written.

KANSAS GAS AND ELECTRIC COMPANY

By _____
President

ATTEST:

_____
Secretary

KANSAS CITY POWER & LIGHT COMPANY

By _____
Chairman of the Board and President

ATTEST:

_____
Secretary

KANSAS ELECTRIC POWER COOPERATIVE, INC.

By _____
President

ATTEST:

_____
Secretary

STATE OF KANSAS)
) ss
COUNTY OF COFFEY)

On this 28 day of DEC, 1981, before me, a Notary Public in and for said County in the State aforesaid, personally appeared WILSON K. CADMAN, to me personally known, who, being by me duly sworn, did say that he is the President of KANSAS GAS AND ELECTRIC COMPANY, a Kansas corporation, one of the corporations described in and which executed the foregoing instrument, that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors; and said WILSON K. CADMAN acknowledged said instrument and the execution thereof to be the free and voluntary act and deed of said corporation by it voluntarily executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid the day and year first above written.

Bonnie Davies
Notary Public

My commission expires:

9-4-84

BONNIE DAVIES NOTARY PUBLIC STATE OF KANSAS

STATE OF KANSAS)
) ss
COUNTY OF COFFEY)

On this 28 day of DEC, 1981, before me, a Notary Public in and for said County in the State aforesaid, personally appeared ARTHUR J. DOYLE, to me personally known, who, being by me duly sworn, did say that he is the Chairman of the Board and President of KANSAS CITY POWER & LIGHT COMPANY, a Missouri corporation, one of the corporations described in and which executed the foregoing instrument, that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors; and said ARTHUR J. DOYLE acknowledged said instrument and the execution thereof to be the free and voluntary act and deed of said corporation by it voluntarily executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid the day and year first above written.

Bonnie Davies
Notary Public

My commission expires:

9-4-84

BONNIE DAVIES NOTARY PUBLIC STATE OF KANSAS

STATE OF KANSAS)
) ss
COUNTY OF SEDGWICK)

On this 23rd day of December, 1981, before me, a Notary Public in and for said County in the State aforesaid, personally appeared CHARLES ELLIS to me personally known, who, being by me duly sworn, did say that he is the President of KANSAS ELECTRIC POWER COOPERATIVE, INC., a Kansas corporation, one of the corporations described in and which executed the foregoing instrument, that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors; and said CHARLES ELLIS acknowledged said instrument and the execution thereof to be the free and voluntary act and deed of said corporation by it voluntarily executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid the day and year first above written.

Karen L. Martin
Notary Public

My commission expires:

10-15-84

KAREN L. MARTIN
NOTARY PUBLIC
STATE OF KANSAS

This Instrument was filed for record on the 28 day of December A. D., 1981 at 2:20 o'clock P. M. and duly recorded in Book W of Misc at page 465-50.

Ruth L Stukey
REGISTER OF DEEDS

By s/Linda M Traylor Deputy

Fee $40.00
$ 1.00 Names Not Typed under Signature

EXHIBIT A

TRACT A (Seal)

Description of Wolf Creek Generating Station Perimeter Boundary Located in Coffey County, Kansas

Beginning at the W 1/4 Cor Sec 24-T20S-R15E, thence East to the NE Cor W 1/2 W 1/2 SE 1/4 of said Sec 24, thence South to the SE Cor W 1/2 NW 1/4 NE 1/4 Sec 25-T20S-R15E, thence West to the West line of NE 1/4 of said Sec 25, thence South to the S 1/4 Cor said Sec 25, thence West to a point 797.8 feet East of the NW Cor NW 1/4 Sec 36-T20S-R15E, thence South 520 feet, thence Southeasterly to a point 1020 feet West of the SE Cor N 1/2 NW 1/4 of said Sec 36, thence South 200 Feet, thence West 621.85 feet, thence South 1198.97 feet, thence Southeasterly 350.7 feet to a point 180 feet South of the NE Cor W 1/2 SW 1/4 of said Section 36, thence South to the NE Cor SW 1/4 SW 1/4 of said Sec 36, thence East to the East line of W 1/2 of said Sec 36, thence South to the S 1/4 Cor of said Sec 36, thence East to the SW Cor E 1/2 SE 1/4 SE 1/4 of said Sec 36, thence North to the NW Cor E 1/2 SE 1/4 SE 1/4 of said Sec 36, thence East to the NE Cor W 1/2 SW 1/4 SW 1/4 Sec 31-T20S-R16E, thence South to the SE Cor of said W 1/2 SW 1/4 SW 1/4, thence East to the NE Cor Sec 6-T21S-R16E, thence South to the NW Cor S 1/2 N 1/2 Sec 5-T21S-R16E thence East to the NE Cor SW 1/4 NW 1/4 Sec 4-T21S-R16E, thence South to the SE Cor SW 1/4 SW 1/4 of said Sec 4, thence West to the NE Cor Sec 8-T21S-R16E, thence South to the SE Cor of said Sec 8, thence West 1704.96 feet, thence South to the North line S 1/2 NE 1/4 Sec 17-T21S-R16E, thence East to the NE Cor S 1/2 NW 1/4 Sec 16-T21S-R16E, thence South to the S 1/4 Cor Sec 21-T21S-R16E, thence West to a point 450 feet West of SE Cor Sec 20-T21S-R16E, thence South to a point 450 feet West of the E 1/4 Cor Sec 29-T21S-R16E, thence West to the center of said Sec 29, thence South to the SE Cor N 1/2 SW 1/4 of said Sec 29, thence West to the SW Cor of said N 1/2 SW 1/4, thence North to the SE Cor of the North 70 acres of the SE 1/4 Sec 30-T21S-R16E, thence West to the SW Cor of the North 70 acres of said SE 1/4, thence North to the center of said Sec 30, thence West to the W 1/4 Cor of said Sec 30, thence North to the NW Cor of said Sec 30, thence West to the SW Cor E 1/2 E 1/2 SE 1/4 of Sec 24-T21S-R15E, thence North to the NW Cor of said E 1/2 E 1/2 SE 1/4, thence East to the SE Cor NE 1/4 of said Sec 24, thence North to the SE Cor NE 1/4 SE 1/4 Sec 13-T21S-R15E, thence West to the SW Cor of said NE 1/4 SE 1/4, thence North to the NW Cor of said NE 1/4 SE 1/4, thence West to the center of said Sec 13, thence North to the N 1/4 Cor said Sec 13, thence West to the SW Cor SE 1/4 SW 1/4 of Sec 12-T21S-R15E, thence North to the NW Cor of said SE 1/4 SW 1/4, thence West to the SW Cor NW 1/4 SW 1/4 of said Sec 12, thence North to the NW Cor of said Sec 12, thence West to the SW Cor E 1/2 SE 1/4 Sec 2-T21S-R15E, thence North 1700 feet, thence West 670 feet, thence North to the North line S 1/2 NE 1/4 of said Sec 2, thence West to the NW Cor S 1/2 NE 1/4 of said Sec 2, thence North to a point 1050 feet South of the North line of said Sec 2, thence West 600 feet, thence North to a point 720 feet West of NE Cor SE 1/4 Sec 34-T20S-R15E, thence East to

the center of Sec 35-T20S-R15E, thence North to the center of Sec 26-T20S-R15E, thence East to the SE Cor W 1/2 SE 1/4 NE 1/4 of said Sec 26, thence North to the NE Cor of said W 1/2 SE 1/4 NE 1/4, thence East to the East line of said Sec 26, thence North to the W 1/4 Cor Sec 24-T20S-R15E being the point of beginning, except Stringtown Cemetery and except a tract in the NE 1/4 NE 1/4 Sec 1-T21S-R15E described as beginning at a point 1060.0 feet South of NE Cor said NE 1/4, thence West 446.9 feet, thence South 730.0 feet, thence East 446.0 feet, thence North 726.2 feet to point of beginning.

With respect to the following properties, which are contained within the above perimeter description, said properties are held by way of an easement acquired by way of condemnation and are subject to certain rights of reversion:

The South 1/2 of the Southeast 1/4 and the Southeast 1/4 of the Southwest 1/4 of Section 35, Township 20 South, Range 15 East.

A tract in Section 1, Township 21 South, Range 15 East described as commencing at a point situated in the center of Wolf Creek about 41 rods West of the Southeast corner of said Section 1 thence West on said section line to another point in the center of said Wolf Creek, thence down the center of said creek to the place of beginning.

The East 1/2 of the Northwest 1/4, the East 1/2 of the Southwest 1/4, the Northwest 1/4 of the Southwest 1/4, the West 1/2 of the Northeast 1/4 and the Northeast 1/4 of the Northeast 1/4 of Section 12, Township 21 South, Range 15 East, except that part of the North 1/2 of the Northeast 1/4 of Section 12 lying North of Wolf Creek.

The North 1/2 of the Southwest 1/4 of the Northeast 1/4 and the Southwest 1/4 of the Southwest 1/4 of the Northeast 1/4 of Section 30, Township 21 South, Range 16 East.

The West 1/2 of the Northwest 1/4 of Section 29 and the Southeast 1/4 of the Northeast 1/4 and the Southeast 1/4 of the Southwest 1/4 of the Northeast 1/4 of Section 30, all in Township 21 South, Range 16 East.

The North 1/2 of the Southeast 1/4 and the South 1/2 of the Southwest 1/4 of Section 19, Township 21 South, Range 16 East, except tract 16 rods X 20 rods for school located in Southeast corner thereof.

SE 1/4 of Section 17, Township 21 South, Range 16 East.

NE 1/4 and the N 1/2 of the SE 1/4 of Section 20, Township 21 South, Range 16 East.

Sheriff's deed

TRACT B

Legal description of railroad rights-of-way

THE FOLLOWING DESCRIBED PROPERTY LOCATED IN COFFEY COUNTY, KANSAS:

The East 1/2 of the Northwest 1/4 of Section 9, Township 21 South, Range 16 East.

Said easement to be a strip one hundred twenty (120) feet in width being sixty (60) feet right and left of the following described center line: Beginning at a point on the West line of said East 1/2 of the Northwest 1/4 which point is 200 feet North of the Southwest corner of said East 1/2 of the Northwest 1/4 thence Southeasterly to a point on the South line of said East 1/2 of the Northwest 1/4 which point is 112 feet East of the Southwest corner of said East 1/2 of the Northwest 1/4.

The Southwest 1/4 of Section 9, Township 21 South, Range 16 East.

Said easement to be a strip one hundred fifty (150) feet in width being 75 feet right and left of the following described center line: Beginning at a point on the North line of said Southwest 1/4 which point is 1203 feet West of the Northeast corner of said Southwest 1/4 thence Southeasterly to a point on the East line of said Southwest 1/4 which point is 492 feet North of the Southeast corner of said Southwest 1/4.

Beginning at the Southwest corner of the South 1/2 of the Southeast 1/4 of Section 9, Township 21 South, Range 16 East, thence North along the West line of said South 1/2 of the Southeast 1/4 a distance of 630 feet, thence Southeasterly to a point on the South line of said South 1/2 of the Southeast 1/4 which point is 360 feet East of point of beginning, thence West to point of beginning, containing 2.6 acres, more or less.

The West 1/2 of the Northeast 1/4 of Section 16, Township 21 South, Range 16 East.

Said easement to be a strip one hundred eighty (180) feet in width being ninety (90) feet right and left of the following described center line: Beginning at a point on the North line of said West 1/2 of the Northeast 1/4 which point is 275 feet East of the Northwest corner of said West 1/2 of the Northeast 1/4 thence Southeasterly to a point on the East line of said West 1/2 of the Northeast 1/4 which point is 1859 feet South of the Northeast corner of said West 1/2 of the Northeast 1/4.

The Southeast 1/4 of the Northeast 1/4 of Section 16, Township 21 South, Range 16 East, Coffey County, Kansas.

The easement to consist of a strip described as follows:

A strip one hundred (100) feet in width across the Southeast 1/4 of the Northeast 1/4 of Section 16, Township 21 South, Range 16 East, being fifty (50) feet right and left of a line between a point on the West line of said Southeast 1/4 of the Northeast 1/4 which point is 532 feet South of the Northwest corner of said Southeast 1/4 of the Northeast 1/4 and a point on the South line of said Southeast 1/4 of the Northeast 1/4 which point is 447 feet East of the Southwest corner of said Southeast 1/4 of the Northeast 1/4, containing 1.75 acres, more or less.

The Northeast 1/4 of the Southeast 1/4 of Section 16, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the North line of said Northeast 1/4 of the Southeast 1/4 which point is 447 feet East of the Northwest corner of said Northeast 1/4 of the Southeast 1/4 thence Southeasterly to a point on the South line of said Northeast 1/4 of the Southeast 1/4 which point is 125 feet West of the Southeast corner of said Northeast 1/4 of the Southeast 1/4.

The Southeast 1/4 of the Southeast 1/4 of Section 16, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the North line of said Southeast 1/4 of the Southeast 1/4 which point is 125 feet West of the Northeast corner of said Southeast 1/4 of the Southeast 1/4 thence Southeasterly to a point on the East line of said Southeast 1/4 of the Southeast 1/4 which point is 222 feet South of the Northeast corner of said Southeast 1/4 of the Southeast 1/4.

The South 1/2 of the Southwest 1/4 of Section 15, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the West line of said South 1/2 of the Southwest 1/4 which point is 222 feet South of the Northwest corner of said South 1/2 of the Southwest 1/4 thence Southeasterly to a point on the South line of said South 1/2 of the Southwest 1/4 which point is 623 feet East of the Southwest corner of said South 1/2 of the Southwest 1/4.

A strip one hundred (100) feet in width across the Northwest 1/4 of Section 22, Township 21 South, Range 16 East being fifty (50) feet right and left of a line between a point on the North line of said Northwest which point is 623 feet East of the Northwest corner of said Northwest 1/4 and a point on the South line of said Northwest 1/4 which point is 535 feet West of the Southeast corner of said Northwest 1/4. Also a temporary easement fifteen (15) feet in width adjacent to each side of the above described easement. Said temporary easement to expire upon completion of construction.

A strip one hundred forty (140) feet in width across the Northeast 1/4 of the Southwest 1/4 and the South 1/2 of the Northwest 1/4 of the Southeast 1/4 of Section 22, Township 21 South, Range 16 East being seventy (70) feet right and left of a line between a point on the North line of said Northeast 1/4 of the Southwest which point is 535 feet West of the Northeast corner of said Northeast 1/4 of the Southwest 1/4 and a point on the South line of said South 1/2 of the Northwest 1/4 of the Southeast 1/4 which point is 212 feet East of the Southwest corner of said South 1/2 of the Northwest 1/4 of the Southeast 1/4.

The Southeast 1/4 of the Southwest 1/4 and the Southwest 1/4 of the Southeast 1/4 of Section 22, Township 21, Range 16 East of the 6th Principal Meridian.

The Northeast 1/4 of Section 27, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the North line of said Northeast 1/4 which point is 958 feet East of the Northwest corner of said Northeast 1/4 thence Southeasterly to a point on the South line of said Northeast 1/4 which point is 200 feet West of the Southeast corner of said Northeast 1/4.

The Northeast 1/4 of the Southeast 1/4 of Section 27, Township 21 South, Range 16 East.

Said easement to be described as follows: Beginning at the Northeast corner of the Northeast 1/4 of the Southeast 1/4 thence South 460 feet, thence Northwesterly to a point on the North line of said Northeast 1/4 of the Southeast 1/4 which point is 265 feet West of the point of beginning, thence East 265 feet to point of beginning. Easement to contain 1.39 acres more or less.

Also a temporary construction easement for road on a strip 90 feet in width lying adjacent to the Westerly side of the above described easement and extending both Northwesterly and Southeasterly to the property lines.

The North 1/2 of the Southwest 1/4 of Section 26, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the West line of said North 1/2 of the Southwest 1/4 which point is 356 feet South of the Northwest corner of said North 1/2 of the Southwest 1/4 thence Southeasterly to a point on the South line of said North 1/2 of the Southwest 1/4 which point is 545 feet East of the Southwest corner of said North 1/2 of the Southwest 1/4.

The South 1/2 of the Southwest 1/4 of Section 26, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the North line of said South 1/2 of the Southwest 1/4 which point is 545 feet East of the Northwest corner of said South 1/2 of the Southwest 1/4 thence Southeasterly to a point on the South line of said South 1/2 of the Southwest 1/4 which point is 1300 feet East of the Southwest corner of said South 1/2 of the Southwest 1/4.

A strip one hundred (100) feet in width across the North 1/2 of the Northwest 1/4 of Section 35, Township 21 South, Range 16 East being fifty (50) feet right and left of a line between a point on the North line of said North 1/2 of the Northwest 1/4 which point is 1300 feet East of the Northwest corner of said North 1/2 of the Northwest 1/4 and a point on the South line of said North 1/2 of the Northwest 1/4 which point is 564 feet West of the Southeast corner of said North 1/2 of the Northwest 1/4. Also a temporary easement fifteen (15) feet in width adjacent to each side of the above described easement. Said temporary easement to expire upon completion of construction.

The South 1/2 of the Northwest 1/4 of Section 35, Township 21 South, Range 16 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the North line of said South 1/2 of the Northwest 1/4 which point is 564 feet West of the Northeast corner of said South 1/2 of the Northwest 1/4 thence with a bearing of South 31 degrees 52'21" East a distance of 543.71 feet to a point of curvature thence Southeasterly 462.45 feet along a curve to the left with a radius of 1910.08 feet and a central angle of 13 degrees 52'18.5" to a point on the East line of said South 1/2 of the Northwest 1/4 which point is 475 feet North of the Southeast corner of said South 1/2 of the Northwest 1/4.

The West 1/2 of the Northeast 1/4 of Section 35, Township 21 South, Range 16 East. Said easement to be described as follows: A strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the West line of said West 1/2 of the Northeast 1/4 which point is 475 feet North of the Southwest corner of said West 1/2 of the Northeast 1/4 thence Southeasterly along a curve to the left with a radius of 1910.08 feet and a degree of curvature of 3 degrees to a point on the South line of said East 1/2 of the Northeast 1/4 which point is located 790 feet East of the Southwest corner thereof. Said easement to contain approximately 2.07 acres more or less.

The Southeast 1/4 of Section 35, Township 21 South, Range 16 East.

Said easement to be: The North one hundred and thirty-five (135) feet of the East twenty-one hundred (2100) feet of the above described property.

The Southwest 1/4 of Section 36, Township 21 South, Range 16 East.

Said easement to be: The North one hundred and sixty-five (165) feet of the above described property.

The West 1/2 of the Northeast 1/4 and the Northwest 1/4 of the Southeast 1/4 of Section 36, Township 21 South, Range 16 East.

Said easement to be a strip one hundred-sixty (160) feet in width being eighty (80) feet right and left of the following described center line: Beginning at a point on the East line of said Northwest 1/4 of the Southeast 1/4, which point is seventy-three (73) feet South of the Northeast corner thereof, thence in a Westerly direction to a point which is six hundred seventy (670) feet West and seventy-four (74) feet South of the Northeast corner thereof. Also a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point which is six hundred seventy (670) feet West and seventy four (74) feet South of the Northeast corner of said Northwest 1/4 of the Southeast 1/4, thence in a Westerly direction to a point on the West line of said Northwest 1/4 of the Southeast 1/4, which point is seventy-five (75) feet South of the Northwest corner thereof. Also a temporary easement being thirty (30) feet in width lying North and adjacent to all that portion of the permanent easement which is one hundred feet in width and a temporary easement being thirty (30) feet in width lying South and adjacent to all that portion of the permanent easement which is one hundred feet in width. Said temporary easement to expire upon completion of construction.

The Northeast 1/4 of the Southeast 1/4 and the East 1/2 of the Northeast 1/4 of Section 36, Township 21 South, Range 16 East.

Said easement to be the following described tract: Beginning at the Northwest corner of said Northeast 1/4 of the Southeast 1/4 thence South along the West line of said Northeast 1/4 of the Southeast 1/4 a distance of 148.09 feet thence East to a point on the East line of said Northeast 1/4 of the Southeast 1/4 which point is 120.975 feet South of the Northeast corner of said Northeast 1/4 of the Southeast 1/4 thence North along the East line of said Northeast 1/4 of the Southeast 1/4 a distance of 100 feet thence West to the Northwest corner of said Northeast 1/4 of the Southeast 1/4 being the point of beginning also a temporary construction easement lying 15 feet North and 15 feet South and adjacent to the above tract describing the permanent easement.

The North fifty-two (52) acres of the Southwest 1/4 of Section 31, Township 21 South, Range 17 East.

Said easement to be: The North one hundred and twenty-one (121) feet of the above described property.

The South 120 feet of the East 360 feet of the Southeast 1/4 of the Northwest 1/4 of Section 31, Township 21 South, Range 17 East, Coffey County, Kansas.

The North 1/2 of the Southeast 1/4 of Section 31, Township 21 South, Range 17 East.

Said easement to be: The North one hundred and thirty-one (131) feet of the above described property.

The West 1/2 of the Southwest 1/4 of Section 32, Township 21 South, Range 17 East.

Said easement to be: The North one hundred and seventy-five (175) feet of the above described property.

The East 1/2 of the Southwest 1/4 of Section 32, Township 21 South, Range 17 East.

Said easement to be a strip one hundred twenty (120) feet in width being sixty (60) feet right and left of the following described center line: Beginning at a point on the West line of said East 1/2 of the Southwest 1/4 which point is 105 feet South of the Northwest corner of said East 1/2 of the

Southwest 1/4 thence easterly to a point on the East line of said East 1/2 of the Southwest 1/4 which point is 165 feet South of the Northeast corner of said East 1/2 of the Southwest 1/4.

A strip one hundred forty (140) feet in width across the Southeast 1/4 of Section 32, Township 21 South, Range 17 East, being seventy (70) feet right and left of a line described as follows: Beginning at a point on the West line of said Southeast 1/4 which point is 165 feet South of the Northwest corner of said Southeast 1/4, thence with a bearing of South 89 degrees 13'50" East a distance of 2496.61 feet to a point of curvature, thence Southeasterly 162.17 feet along a curve to the right with a radius of 1910.08 feet and a central angle of 4 degrees 51'52" to a point on the East line of said Southeast 1/4 which point is 292 feet South of the Northeast corner of said Southeast 1/4.

The Southwest 1/4 of Section 33, Township 21 South, Range 17 East.

Said easement to be a strip one hundred (100) feet in width being fifty (50) feet right and left of the following described center line: Beginning at a point on the East line of said Southwest 1/4 which point is 1272 feet South of the Northeast corner of said Southwest 1/4 thence with a bearing of North 70 degrees 06'12" West a distance of 2332.07 feet to a point of curvature thence Northwesterly 475.47 feet along a curve to the left with a radius of 1910.08 feet and a central angle of 14 degrees 15'45.5" to a point on the West line of said Southwest 1/4 which point is 292 feet South of the Northwest corner of said Southwest 1/4 of Section 33.

The Southeast 1/4 of Section 33, Township 21 South, Range 17 East.

Said easement to be a strip one hundred twenty (120) feet in width being sixty (60) feet right and left of the following described center line: Beginning at a point on the West line of said Southeast 1/4 which point is 1272 feet South of the Northwest corner of said Southeast 1/4 thence Southeasterly to a point on the East line of said Southeast 1/4 which point is 333 feet North of the Southeast corner of said Southeast 1/4 of Section 33.

The Southwest 1/4 and the West 1/2 of the Southeast 1/4 of Section 34, Township 21 South, Range 17 East.

Said easement to be a strip one hundred and sixty (160) feet in width being eighty (80) feet right and left of the following described center line: Beginning at a point on the West line of said Southwest 1/4 which point is 333 feet North of the Southwest corner of said Southwest 1/4 thence with a bearing of South 70 degrees 06'12" East a distance of 111.35 feet to a point of curvature, thence 1118.67 feet Southeasterly along a curve to the left with a radius of 1910.08 feet and a central angle of 33 degrees 33'22.7" to a point of tangency, thence with a bearing of North 76 degrees 20'25.3" East a distance

of 553.21 feet along the tangent line to a second point of curvature, thence 203.68 feet Northeasterly along a curve to the left with a radius of 1910.08 feet and a central angle of 6 degrees 6'34.8" to a point of tangency, thence with a bearing of North 70 degrees 13'50.5" East a distance of 309.61 feet along the tangent line to the center of a spur to be built 15 feet North of the existing Missouri Pacific Railroad which corresponds to state plane coordinates North 561,211.01± and East 2,854,222.78± also a temporary construction easement lying fifty (50) feet North of and adjacent to the North right-of-way line of the Missouri Pacific Railroad between the last above described point and the East line of said West 1/2 of the Southeast 1/4 of Section 34.

Beginning at a point located 2224.1 feet East and 486.9 feet North of the Southwest corner of Section 34, Township 21 South, Range 17 East thence North 72 degrees 2'48" East along and parallel to the North Right-of-Way line of the Missouri Pacific Railroad to a point a distance of 1357.54 feet, thence North 17 degrees 57'12" West to a point a distance of 24 feet, thence South 72 degrees 2'48" West to a point a distance of 1357.54 feet, thence South 17 degrees 57'12" East a distance of 24 feet to the point of beginning, said tract to contain .748 acres, more or less.

TRACT C

Legal description of other lands or land rights to be held as jointly owned "Property" for operation of Wolf Creek Station.

Properties Owned in Fee:

Township 20 South, Range 15 East

The East 1/2 of the Southeast 1/4 of Section 22.

The East 1/2 of Section 23.

The South 1/2 of the North 1/2 and the East 1/2 of the Southeast 1/4 and the East 1/2 of the West 1/2 of the Southeast 1/4, all in Section 24.

The East 1/2 of the Northeast 1/4 and the East 1/2 of the West 1/2 of the Northeast 1/4 and the West 1/2 of the Southwest 1/4 of the Northeast 1/4, all in Section 25.

The West 1/2 of the East 1/2 of the Northeast 1/4 and the East 1/2 of the Northeast 1/4 of the Northeast 1/4, all in Section 26.

The East 1/2 of the Southeast 1/4 of Section 34 except the East 720 feet thereof.

The Northwest 1/4 of the Northeast 1/4 ~~and the Northeast 1/4 of the Southwest 1/4~~ and the Southwest 1/4 of the Southeast 1/4 and the Northeast 1/4 of the Southeast 1/4 and the West 1/2 of the Southeast 1/4 of the Southeast 1/4, all in Section 36.

Township 20 South, Range 16 East

The West 1/2 of Section 31 except the West 1/2 of the Southwest 1/4 of the Southwest 1/4.

Township 21 South, Range 15 East

The Northwest 1/4 and the Northeast 1/4 of the Southwest 1/4 and the Northwest 1/4 of the Southeast 1/4 of Section 13.

The Northeast 1/4 of Section 14 except the Northwest 1/4 of the Northwest 1/4 of the Northeast 1/4, and except the West 100 feet of the Northeast 1/4 of the Northwest 1/4 of the Northeast 1/4; also that part of the South 1/2 of the North 1/2 of the Northwest 1/4 of said Section 14 lying East of U.S. 75 Highway; also a tract beginning at the intersection of the East right-of-way line of U.S. 75 Highway and the North line of the South 1/2 of the Northwest 1/4 of said Section 14 thence East to the East line of said Quarter Section thence South Eighty (80) rods, thence West One Hundred Sixty (160) rods, thence

North Thirty-seven (37) rods and Twelve and one-half (12-1/2) feet, thence East to the East right-of-way line of U.S. 75 Highway, thence Northerly along said right-of-way line to point of beginning; also a tract commencing at the Northwest corner of the Southwest Quarter of Section 14, thence East One Hundred Sixty (160) rods, thence South Fifty-Seven (57) rods, thence West to Neosho River, thence up said River to a point Ten (10) rods, South of Beginning, thence North to beginning, EXCEPT land deeded for Highway purposes, all in Section 14, Township 21 South, Range 15 East of the 6th Principal Meridian, AND EXCEPT, the following described tract, to-wit: Beginning at the Southwest corner of the Northwest Quarter of Section 14, Township 21 South, Range 15 East, thence North 37 rods and 12-1/2 feet, thence East to the West right-of-way line of U.S. Highway 75, thence Southerly along the Westerly right-of-way line of said Highway to the Neosho River, thence up said River to a point 10 rods South of beginning, thence North to beginning, containing 10 acres, more or less, the last said tract being conveyed by deed dated August 8, 1975 to John A. Decker and Delores Decker, husband and wife.

Township 21 South, Range 16 East

The North 1/2 of the Northwest 1/4 of Section 5.

The West 1/2 of the Northwest 1/4 of Section 9.

~~That part of the East 450 feet of the Northeast 1/4 of Section 29 lying West of~~ FAS 10 Highway except land deeded to Logan Cemetery District Association described as: Commencing at the Southeast corner of Northeast Quarter of the said Section 29, which is on the center line of the road (new location FAS-10), Coordinates of which referred to the Kansas State-Plane Coordinate System, South Zone are N 567,613.52, E 2, 814,601.93, thence N1°-47'-02"W 352.45 feet along the center line of the road, thence S88°-12'-58"W, 125.00 feet which is at right angle to the center line of the road, to the actual point of beginning, thence West, 314.46 feet, thence North, 495.00 feet, thence East, 210.00 feet to the point which is 125.00 feet Westerly from the center line of the road, thence S22°-56'03"E, 117.19 feet to the PC (point of curvature) of the curve with the following data, Δ = 21°-09'-00", R = 693.51, T = 129.48, L = 256.00 curve right, thence 256.00 feet along the curve to the PT (point of tangency), thence S 1° 47' 02" E, 138.48 feet, to the point of beginning containing 3.23 acres.

The East 1/2 of the Northwest 1/4 of Section 34, less a tract beginning at the Northwest corner of said E 1/2 NW 1/4, thence South to Long Creek, thence up Long Creek at low-water mark in a Northeasterly direction to the Section line, thence due West to the place of beginning.

~~Township 21 South, Range 17 East~~

~~That part of the North 52 Acres of the Southwest 1/4 of Section 31 lying East of the center of Crooked Creek, subject to railroad right-of-way, and containing 8 Acres, more or less.~~

Still owns

Easements:

Flowage easement held by Kansas Gas and Electric Company on the Northwest diagonal 1/2 of the Northwest 1/4 of the Southeast 1/4 of Section 29, Township 21 South, Range 16 East.

Flowage easement held by Kansas Gas and Electric Company on the East 1/2 of the Northwest 1/4 of Section 9, Township 21, Range 16 East.

A tract of land in the Northwest 1/4 of Section 10, Township 21 South, Range 15 East, Coffey County, Kansas, said tract more particularly described as commencing at a point on the East line of said Northwest 1/4, said point being 614.17 feet South of the Northeast corner thereof; thence West 1,799.57 feet to a point, said point being the point of beginning; thence South 65 degrees 46'03" West, 70.00 feet; thence North 24 degrees 13'56" West, 473.25 feet; thence North 65 degrees 37'57" East, 70.00 feet; thence South 24 degrees 13'58" East, 473.41 feet, more or less, to the point of beginning. Containing 0.76 acre, more or less.

A strip, piece, or parcel of land 1,947.80 feet in length, and 25.00 feet in width, lying in the Northwest 1/4 of Section 10, Township 21 South, Range 15 East, Coffey County, Kansas, the centerline described as beginning at a point on the east line of said Northwest 1/4, said point being 103.27 feet, South of the Northeast corner thereof; thence South 88 degrees 36'38" West, 219.82 feet; thence South 44 degrees 58'48" West, 947.64 feet; thence South 83 degrees 58'52" West, 780.34 feet, to the point of termination. Containing 1.88 acres, more or less.

Beginning at a point on the West line of the North 1/2 of the Northeast 1/4 of Section 10, Township 21 South, Range 15 East which point is 25 feet South of the Northwest corner of said Northeast 1/4, thence East along the South right-of-way line of the public road to the East line of said Northeast 1/4, thence South 113 feet, thence West to a point on the West line of said Northeast 1/4 which point is 135 feet South of point of beginning, thence North to point of beginning.

The South sixty (60) feet of the North one hundred ten (110) feet of the Northwest 1/4 of Section 11, Township 21 South, Range 15 East, being the North sixty (60) feet of Lot 1 and Lots 23 through 31 inclusive as shown on the recorded plat of said property.

The South 135 feet of the North 160 feet of the West 1950 feet of the North 1/2 of the Northeast 1/4 of Section 11, Township 21 South, Range 15 East together with the rights of ingress and egress to and from the same.

A flowage easement on the North 52 acres of the Southwest 1/4 of Section 31, Township 21 South, Range 17 East, lying West of Crooked Creek, Coffey County, Kansas.

AMENDMENT TO
WOLF CREEK GENERATING STATION
OWNERSHIP AGREEMENT

January 1, 1987

AMENDMENT TO
WOLF CREEK GENERATING STATION
OWNERSHIP AGREEMENT

THIS AMENDMENT TO WOLF CREEK GENERATING STATION OWNERSHIP AGREEMENT is made as of January 1, 1987, by and among KANSAS GAS AND ELECTRIC COMPANY ("KG&E"), a Kansas corporation having its principal office at Wichita, Kansas; KANSAS CITY POWER & LIGHT COMPANY ("KCPL"), a Missouri corporation having its principal office at Kansas City, Missouri; and KANSAS ELECTRIC POWER COOPERATIVE, INC. ("KEPCo"), a Kansas corporation having its principal office at Topeka, Kansas.

WHEREAS, KG&E, KCPL and KEPCo are parties to the WOLF CREEK GENERATING STATION OWNERSHIP AGREEMENT, dated December 28, 1981, recorded with the Coffey County, Kansas Register of Deeds in Book W at page 465; and

WHEREAS, KG&E, KCPL and KEPCo have formed Wolf Creek Nuclear Operating Corporation, a Delaware corporation wholly owned by them, for the purpose of operating, maintaining, repairing, decontaminating and decommissioning Wolf Creek Generating Station; and

WHEREAS, KG&E, KCPL and KEPCo desire to amend the WOLF CREEK GENERATING STATION OWNERSHIP AGREEMENT in order to designate Wolf Creek Nuclear Operating Corporation as Operating Agent of Wolf Creek Generating Station in substitution for KG&E;

NOW, THEREFORE, THE PARTIES HERETO AGREE AS FOLLOWS:

(1) Effective as of January 1, 1987, Section 3.7 of the WOLF CREEK GENERATING STATION OWNERSHIP AGREEMENT, dated December 28, 1981, is hereby amended by substituting "Wolf Creek Nuclear Operating Corporation" for "KG&E" at all references to KG&E as Operating Agent.

(2) In all other respects, said WOLF CREEK GENERATING STATION OWNERSHIP AGREEMENT shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers the day and year first above written.

ATTEST:
Secretary

KANSAS GAS AND ELECTRIC COMPANY
By
WILSON K. CADMAN

ATTEST:
Secretary

KANSAS CITY POWER & LIGHT COMPANY
By
ARTHUR J. DOYLE

ATTEST:
Secretary

KANSAS ELECTRIC POWER COOPERATIVE, INC.
By
ALVIN L. ZWICK

STATE OF Kansas)
) ss
COUNTY OF Sedgwick)

On this 23rd day of December, 1986, before me, a Notary Public in and for said County in the State aforesaid, personally appeared WILSON K. CADMAN, to me personally known, who, being by me duly sworn, did say that he is the Chairman of the Board and President of KANSAS GAS AND ELECTRIC COMPANY, a Kansas corporation, one of the corporations described in and which executed the foregoing instrument, that the seal affixed to the foregoing instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors; and said WILSON K. CADMAN acknowledged said instrument and the execution thereof to be the free and voluntary act and deed of said corporation by it voluntarily executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid the day and year first above written.

Mildred A Cillessen
Notary Public

My commission expires:

January 16, 1990

MILDRED A. CILLESSEN
NOTARY PUBLIC
STATE OF KANSAS
My Appt. Exp. 1-16-90

STATE OF MISSOURI)
) ss
COUNTY OF JACKSON)

On this 19th day of December, 1986, before me, a Notary Public in and for said County and State aforesaid, personally appeared ARTHUR J. DOYLE, to me personally known, who, being by me duly sworn, did say that he is the Chairman of the Board and President of KANSAS CITY POWER & LIGHT COMPANY, a Missouri corporation, one of the corporations described in and which executed the foregoing instrument, that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors; and said ARTHUR J. DOYLE acknowledged said instrument and the execution thereof to be the free and voluntary act and deed of said corporation by it voluntarily executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid the day and year first above written.

Betty Bonsher
Notary Public

My commission expires:

September 28, 1988

BETTY BONSHER
NOTARY PUBLIC STATE OF MISSOURI
CLAY CO.
MY COMMISSION EXP. SEPT 28,1988
ISSUED THRU MISSOURI NOTARY ASSOC.

STATE OF Kansas)
) ss
COUNTY OF Dickinson)

On this 26th day of December, 198 6, before me, a Notary Public in and for said County in the State aforesaid, personally appeared ALVIN L. ZWICK to me personally known, who, being by me duly sworn, did say that he is the President of KANSAS ELECTRIC POWER COOPERATIVE, INC., a Kansas corporation, one of the corporations described in and which executed the foregoing instrument, that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors; and said ALVIN L. ZWICK acknowledged said instrument and the execution thereof to be the free and voluntary act and deed of said corporation by it voluntarily executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid the day and year first above written.

Belva Jean Lightner
Notary Public
BELVA JEAN LIGHTNER

My Commission expires:
BELVA JEAN LIGHTNER
State of Kansas
My Appt. Exp. 7-13-88

ORIGINAL COMPARED WITH RECORD

RRI

State of Kansas, Coffey County, ss
This instrument was filed for record on
the 30 day of December A. D., 19 86
at 1:05 o'clock P. M. and duly recorded
in Book EE of Misc at page 351-353
Ruth L. Stukey
REGISTER OF DEEDS
By Linda M. Traylor Deputy
Fee $7.00

WOLF CREEK GENERATING STATION

OPERATING AGREEMENT

among

KANSAS GAS AND ELECTRIC COMPANY

KANSAS CITY POWER & LIGHT COMPANY

KANSAS ELECTRIC POWER COOPERATIVE, INC.

and

WOLF CREEK NUCLEAR OPERATING CORPORATION

This AGREEMENT made and entered into on this 15th day of April, 1986 among Kansas Gas and Electric Company ("KG&E"), Kansas City Power & Light Company ("KCPL"), Kansas Electric Power Cooperative, Inc. ("KEPCo") and Wolf Creek Nuclear Operating Corporation ("Operating Corporation").

W I T N E S S E T H :

WHEREAS, KG&E, KCPL and KEPCo (hereinafter referred to collectively as "Owners" and individually as an "Owner") each own, as tenant in common with the others, an undivided interest in the Wolf Creek Generating Station (hereinafter referred to as the "Station") in accordance with the provisions of the Wolf Creek

Station Ownership Agreement (the "Ownership Agreement") executed on December 28, 1981, the present undivided tenant in common interests ("Ownership Shares") being 47% in the case of KG&E, 47% in the case of KCPL and 6% in the case of KEPCo;

WHEREAS, for the purpose of this Operating Agreement, the term "Station" shall mean (i) the Site as defined in the Ownership Agreement, (ii) all common facilities at the Wolf Creek Station Site, (iii) Wolf Creek Unit #1 and (iv) all functions related to the operation, maintenance, repair, decommissioning and decontamination of (i) through (iii) above including, without limitation, all design, engineering, safety, licensing, fueling, security, technical, corporate and general services, both on and off-Site, it being understood that for purposes of this Operating Agreement, the term "Station" shall not include any Additional Unit(s) as provided under Section 1.1(d) of the Ownership Agreement; and

WHEREAS, it is desirable and to the mutual advantage of the Owners that the Operating Corporation be engaged, under the terms and conditions hereinafter set forth, to operate, maintain, repair, decontaminate and decommission the Station and make any necessary modifications and additions thereto and retirements therefrom on behalf of the Owners.

NOW, THEREFORE, in consideration of these premises, the parties hereto do hereby agree as follows:

ARTICLE 1

Sharing of Capacity and Energy; Scheduling

Section 1.01. The Ownership Agreement specifies, subject to the conditions therein set forth, the respective Capacity Entitlement and Energy Entitlement of each Owner. Subject to those provisions and the policies adopted by the Board of Directors of the Operating Corporation, each Owner (i) may schedule up to its pro rata share of the maximum operating capability of the Station which shall be determined by the Operating Corporation in accordance with Section 1.02 hereof and (ii) shall schedule its share of the minimum operating capability of the Station, all in accordance with the provisions of this Article of the Agreement.

Section 1.02. The Operating Corporation shall determine the maximum and minimum operating capability of the Station at all times, taking into consideration regulatory requirements and the characteristics of the Station. An Owner's pro rata share of the maximum and minimum operating capability of the Station shall be equivalent to its Ownership Share in the Station.

Section 1.03. An Owner may schedule less than its pro rata share of the minimum operating capability of the Station, provided that another Owner has agreed to schedule, and does

schedule, more than its share of the minimum operating capability of the Station in an amount sufficient to offset such deficiency, and has so advised the Operating Corporation.

Section 1.04. The Operating Corporation shall make available for scheduling and dispatch the Station operating capability in accordance with standard dispatching methods customary in the industry. The Operating Corporation shall make a good faith effort to provide energy to each Owner in accordance with the schedules provided by each Owner. Scheduled load changes will be permitted when it would not jeopardize the safe operation of the Station. If a reduction in the maximum operating capability occurs at the Station, for whatever reason, then each Owner's schedule shall be adjusted to take into account, in accordance with its respective Ownership Share, such reduction in operating capability.

Section 1.05. If the net hourly output of the Station is negative, then each Owner shall provide (from other energy resources available to it or by prearranged purchases from another Owner) its share of the hourly Wolf Creek Station electricity used, based upon its Ownership Share. If the net hourly output of the Station is positive, the Station's hourly electricity uses shall be allocated among the Owners on the basis of each Owner's scheduled deliveries divided by total scheduled deliveries. The Station's use

of electricity shall include transformer losses at the Station. So long as the Station has only one unit installed, energy entitlements under Section 4.2 of the Ownership Agreement shall be measured on the basis of the net output at the transmission side of the step-up transformers in the substation of the Station.

Section 1.06. Operating capability of the Station available to but not scheduled by an Owner shall be subject to the interchange provisions of Section 4.5 of the Ownership Agreement.

Section 1.07. The Operating Corporation shall, to the extent consistent with safe and reliable operation of the Station, coordinate the scheduled maintenance and fueling outages of the Station with each of the Owners.

ARTICLE 2

Services to be Provided by the Operating Corporation

Section 2.01. Consistent with its duties and responsibilities (i) under the Operating License for the Station issued by the Nuclear Regulatory Commission, (ii) as Operating Agent under the Ownership Agreement and (iii) pursuant to the policies of the Owners as reflected by actions taken by the Board of Directors of the Operating Corporation, the Operating Corporation shall provide and be responsible for the operation, maintenance, repair, deconta-

mination and decommissioning of the Station in a safe and reliable manner in accordance with all applicable, lawful licenses and permits and requirements of state and federal regulatory agencies and the generation of power and energy at the Station as economically as is reasonably practicable to meet the Owners' system requirements and economics. The Operating Corporation shall make such further modifications of and additions to and retirements from the Station as shall be consistent with such operation, maintenance, repair, decontamination and decommissioning. Such services and /construction may be provided by the Operating Corporation through its own personnel or in part by others under contractual or other arrangements. In furtherance of the foregoing, the Operating Corporation shall, on behalf of the Owners, among other things and without limitation:

(a) Select, hire, control and discharge personnel, who will be employees solely of the Operating Corporation, and select and retain the services of contractors and consultants and/or direct, supervise and control certain employees of one or more of the Owners if such Owner or Owners shall agree to such direction, supervision and control;

(b) Arrange for the procurement on behalf

of the Owners of nuclear fuel including uranium and provide for the enrichment, conversion and fabrication thereof and storage and/or disposal or reprocessing of such fuel (as permitted by law or regulation);

(c) Arrange for the purchase on behalf of the Owners of materials, services and supplies for the Station;

(d) Design, construct, start-up and test modifications of, and additions to, the Station;

(e) Determine and stipulate inventory levels of material and equipment for the Station;

(f) Keep the Owners informed in a reasonable and timely manner concerning the operation, maintenance, repair, decontamination and decommissioning activities at the Station and of additions or modifications to the Station and retirements therefrom;

(g) Prepare, or arrange for the preparation of, in accordance with normal and customary procedures, annual budgets and forecasts for the Station costs, capital expenditures and retirements to be submitted to the Owners. Such budgets and forecasts shall be revised from time to time to reflect material changes in circumstances;

(h) Perform any services and take any action, on behalf of the Owners where appropriate, related to the operation, maintenance, repair, decontamination, and decommissioning of the Station and of additions, modifications and retirements pertaining to the Station as may be necessary or appropriate to comply with the provisions of the Atomic Energy Act, as amended or as it may be amended, or any other applicable statute, rules, regulations, guidelines or similar criteria, and any provisions or conditions of construction permits and operating licenses or similar authorizations granted or that may be granted in connection with the Station and as such permits, licenses or other authorizations may hereafter be amended;

(i) In its capacity as operator of the Station and as agent for the Owners, provide communications to, and receive communications from, the Nuclear Regulatory Commission and/or any successor governmental agency, as well as any other governmental agency having jurisdiction with respect to any aspect of the Station's operation, maintenance, repair, decontamination and decommissioning and of additions thereto and retirements therefrom and, in such capacities, represent (or engage others to represent) the Owners;

(j) Perform, or, if deemed desirable by the Operating Corporation, contract on behalf of the Owners with others (including agencies of Government or their contractors) for materials or services required to place and/or keep the Station in safe and efficient operating condition, to protect the Station property, to conduct research and development with respect thereto and disburse or receive funds in connection therewith. Such work shall be subject to normal and customary review and approval procedures of the Operating Corporation;

(k) Arrange for the maintenance, in accordance with normal and customary procedures, of such necessary books of record, books of account and memoranda of transactions and for the provision of such reports with respect thereto to the Owners as each Owner shall desire to meet its accounting and statistical requirements and to conform to the applicable lawful rules, regulations and requirements of all regulatory bodies having jurisdiction over the Owners. The costs for the Station shall be accumulated in a separate set of accounts;

(l) Provide, or arrange for the provision of, such other data or information with respect to the Station as may be reasonably requested by the Owners from time to time; and

(m) Perform any additional services pertaining to the Station, or any portion thereof, all of which shall be consistent with the intent of this Section 2.01, as may be approved by the Board of Directors of the Operating Corporation.

Section 2.02. Matters and questions arising in connection with the Station which are not within the scope of the authority delegated to the Operating Corporation under this Agreement and are not specifically provided for in this Agreement shall be determined from time to time by the Owners pursuant to Section 3.3 of the Ownership Agreement.

Section 2.03. During operating conditions which the Operating Corporation in its sole judgment deems abnormal, the Operating Corporation shall take such action as it deems appropriate for the public health and safety and the safety of personnel and equipment.

Section 2.04. In order that the safe operation of the Station is assured, the Owners shall not effect any operating or physical changes to their respective transmission and distribution facilities which may affect the safe operation of the Station without prior consultation and concurrence of the Operating Corporation.

ARTICLE 3

Working Fund

Section 3.01. The Owners shall establish and maintain a Working Fund from which the Operating Corporation shall make

payments for all costs pursuant to its services and responsibilities hereunder. The Owners, in consultation with the Operating Corporation, shall determine, initially and from time to time during the term of this Agreement, the amount or amounts required to maintain a satisfactory balance in the Working Fund, and shall be liable in proportion to their respective Ownership Shares for any such additional amounts required to maintain the agreed-upon balance. The Owners shall reimburse the Working Fund promptly on receipt of notice from the Operating Corporation of their respective obligations for reimbursement.

Section 3.02. On termination of this Agreement, as hereinafter provided, any residual unexpended balance in the Working Fund shall be credited to the Owners in proportion to their respective Ownership Shares.

ARTICLE 4

Charges, Financial Statements and Billings

Section 4.01. The Operating Corporation shall arrange for reporting to the Owners for each month, promptly following the end of such month, by written statements the following:

(a) The costs on an accrual basis of operation, maintenance, repair, decontamination and decommissioning of the Station, and the cost

of any Station additions, modifications and retirements including applicable cost of removal and salvage, classified as required to meet the Operating Corporation's obligations under Section 2.01(k) above.

(b) A summary statement of the operation during that month of the Working Fund, showing beginning balance, receipts, disbursements and closing balance.

Section 4.02. Except as otherwise provided in Sections 1.05 and 4.03 hereof, the costs incurred or accrued from all sources during each calendar month in operating, maintaining, repairing, decontaminating and decommissioning the Station and in making additions or modifications to, and retirements from, the Station shall be liabilities of the Owners when incurred or accrued and shall be borne by the Owners in proportion to their Ownership Shares. All such costs shall be determined in accordance with sound accounting practices, and shall include reasonable and appropriate indirect costs including overheads. All of the services rendered hereunder by the Operating Corporation will be at actual cost thereof, without profit to the Operating Corporation. Direct charges will be made for services where a direct allocation of cost is appropriate and equitable.

Section 4.03. When the net hourly output of the Station is positive, nuclear fuel costs and spent fuel disposal costs will be shared among the Owners on the basis of the percentage take of kilowatt hours by each Owner. The percentage take of kilowatt hours shall be calculated by dividing the number of kilowatt hours delivered to that Owner by the total number of kilowatt hours delivered to all Owners. A true up shall be carried out periodically (but not less frequently than annually) which shall adjust each Owner's inventory of nuclear fuel to equal each Owner's Ownership Share. In truing up accounts among the Owners at the end of each period, an Owner or Owners whose percentage take during the period after adjustment for scheduled interchanges under Section 4.5 of the Ownership Agreement, is higher than its Ownership Share (hereinafter "Debit Owner(s)"), shall reimburse an Owner or Owners whose percentage take is less than its Ownership Share (hereinafter "Credit Owner(s)"), for using their fuel. The price to be charged to the Debit Owner shall be the Credit Owner's nuclear fuel cost. "Nuclear fuel cost" is defined as the amortization of costs described by the Federal Energy Regulatory Commission in its Uniform System of Accounts, Account 120, adjusted by adding back (i) the income tax effect of the debt component of Allowance for Funds Used During Construction (AFUDC) and (ii) the benefits realized by reason of such Credit Owner's share in the Uranium Agreement of Settlement among KG&E, KCPL and Westinghouse Electric Corporation, dated February 21, 1980, and shall include DOE disposal costs.

Section 4.04. In recognition of the fact that each Owner has an interest in being assured that the other Owners have made adequate provision for the funding of its Ownership Share of the Station decommissioning costs as contemplated by Section 4.02, each Owner undertakes to utilize its best efforts to provide such assurance to the other Owners, recognizing that there are at the present time some impediments toward achieving that objective. Each Owner shall provide to each other Owner within four months after the end of its fiscal year a report identifying the provision it has made for that year and on a cumulative basis for its share of Station decommissioning costs. If, and to the extent that, requirements have been or are hereafter imposed on an Owner by a federal or state authority in a final order or regulation which specifies that provision be made for decommissioning costs for the Station in a particular manner or manners, such Owner will promptly take such action on its part as may be necessary to comply with such requirements.

Section 4.05. It is the intent of the Owners that so far as possible each Owner shall separately report, file returns with respect to, be responsible for and pay all real property, franchise, business or other taxes, except payroll and sales or use taxes, arising out of its Ownership Share of the Station and that such taxes shall be separately levied and assessed against each Owner. However, to the extent that such taxes may be levied on or assessed against the Station, or its operation, or the

Owners in such a manner as, in the opinion of the Owners, to make impossible or inequitable the carrying out of said intent, then such taxes shall be deemed a part of the costs of operating and maintaining the Station and shall be apportioned among the Owners under this Agreement in accordance with their respective Ownership Shares; provided that the Operating Corporation shall join with the Owners in executing and filing with the Internal Revenue Service such documents as may be appropriate to effect the election required by Section 6.5 of the Ownership Agreement.

Section 4.06. The Owners shall have the right, during the term of this Agreement and thereafter as long as the books, records and memoranda referred to in Section 2.01 shall be preserved, to inspect all such items and to make reasonable audits thereof at their own cost as they may deem necessary to protect their interests.

Section 4.07. In the event an Owner shall question any statement rendered according to the provisions of Sections 4.02 or 4.03 hereof, it shall nevertheless promptly pay the amount indicated in such statement but such payment shall not be deemed to prevent such Owner from claiming or pursuing an adjustment of any statement rendered.

Section 4.08. If it shall be determined that an Owner has paid more or less than its proper share of the operating and capital costs of the Station for the month covered by such statement, an appropriate correcting credit or charge shall be made by the Operating Corporation to the accounts of each of the Owners.

ARTICLE 5

Compliance with Provisions of Permits and Requirements of Governmental Agencies

Section 5.01. Without limiting in any way the authority and responsibility of the Operating Corporation under Section 2.01, the Owners and the Operating Corporation shall cooperate in taking whatever action may be necessary to comply with the terms and provisions of permits and licenses for the Station and with all applicable lawful requirements of any Federal or State agency or regulatory body having jurisdiction in the premises.

ARTICLE 6

Transfers of Personnel from Owners to Operating Corporation

Section 6.01. The employees of the Operating Corporation initially will consist of (i) those KG&E employees who are assigned to its Nuclear Department, (ii) such other KG&E employees who are not in its Nuclear Department but are assigned full-time to Station matters, (iii) such KCPL and KEPCo employees who are assigned full-time to the Station and (iv) such other KG&E em-

ployees who perform, on a part-time basis, services related to KG&E's Nuclear Department if any such employee performing part-time services is requested by the Operating Corporation and is willing to accept transfer to the Operating Corporation and KG&E is willing to transfer such employee to the Operating Corporation; provided that nothing herein shall prohibit the Operating Corporation from contracting with any Owner or with any other party for any services required for the operation, maintenance, repair, decontamination and decommissioning of the Station or any portion thereof; provided, further, that any such services provided by an Owner and charged to the Operating Corporation shall be at the Owner's cost thereof, for which the Owner shall be reimbursed by the Operating Corporation, and the costs for such services provided by an Owner shall be determined in accordance with sound accounting practices, shall include reasonable and appropriate indirect costs, including overheads, and shall be provided without profit to that Owner.

Section 6.02. It is the objective of the Owners that the Operating Corporation will assume, as of the date when an individual is transferred from the employ of an Owner to the Operating Corporation, the obligations, if any, of such Owner to such employee for accrued benefits under the Owner's employee benefit plans in effect at the time of such transfer and the transferring employer will make appropriate provision (by the transfer of funds to a trustee under a plan established by the Operating Corporation, the reservation of funds in its existing

trust fund or otherwise) for the payment of such accrued benefits to the extent that they have been funded as of the date approximating the date of such transfer. Consistent with that objective, the Owners anticipate that, in determining benefits payable by the Operating Corporation under any employee benefit plan established by it to an employee transferred to it by an Owner, the Operating Corporation will give credit for service by such employee with such transferring Owner as if such service had been performed by such transferred employee for the Operating Corporation unless the transferring Owner shall make provision for the direct payment by it of such benefits to the transferred employee. The plans and documentation to achieve this objective shall be established by the boards of directors of the Owners and of the Operating Corporation.

ARTICLE 7

Ownership of Property Related to Station; Other Property

Section 7.01. The Operating Corporation shall own no property which is, or could properly be, classified as "utility property" within the meaning of K.S.A. 66-104. Any and all utility property related to the Station which is now owned by one or more of the Owners shall continue to be owned by such Owner or Owners subject to the provisions of the Ownership Agreement, and this Agreement shall not effect any change in such ownership.

Section 7.02. Any non-utility property utilized in the operation, maintenance, repair, decontamination and decommissioning of the Station may be transferred to the Operating Corporation

upon the approval of the transferring Owner and the Operating Corporation, after obtaining such regulatory authorization, if any, as shall be required.

Section 7.03.(a) Any contract covering the design, engineering, procurement, construction and installation services and major components of the Station and all other contracts relating to operation, maintenance, repair, decontamination and decommissioning of the Station, including contracts for the acquisition of materials, inventories, supplies, spare parts, equipment, fuel or services therefor, heretofore executed solely by KG&E in its own name or as Operating Agent or by all Owners shall be assigned to the Operating Corporation to the extent allowed by those contracts.

(b) Any contract which cannot be assigned to the Operating Corporation shall be administered by the Operating Corporation, and all rights, duties and responsibilities associated with said contract shall be carried out by the Operating Corporation as if the contract had been assigned to the Operating Corporation. Each Owner shall support the Operating Corporation to the extent necessary to protect and defend the Owners' interest in said contract. Any Owner incurring costs to provide such support shall be reimbursed by the Operating Corporation and the other Owners in the manner provided by Section 4.02 hereof.

(c) Future contracts executed by the Operating Corporation will be signed in the name of the Operating Corporation, as agent for the Owners, and Owners will be severally, but

not jointly, obligated by such contracts in proportion to their Ownership Shares.

ARTICLE 8

Insurance; Damages to Persons or Property; Penalties; Fines

Section 8.01. Each Owner and the Operating Corporation will procure and maintain such physical damage, public liability and workers compensation insurance with respect to all losses, damages, liabilities and claims arising out of its ownership interest or the construction or operation of the Station and provision of services hereunder (other than losses, damages, liabilities and claims in the name and/or on behalf of such Owner, hereafter collectively referred to in this Article 8 as a "derivative claim") and the premium costs thereof shall be Station costs to be borne by the Owners separately (but not jointly) in proportion to their Ownership Shares, or, in the alternative upon concurrence of each party hereto, the Owners and the Operating Corporation will jointly procure and maintain such physical damage, public liability, workers compensation and other insurance as they may deem appropriate with respect to all losses, damages, liabilities and claims arising out of their respective ownership interests or the construction or operation of the Station and provision of services hereunder other than derivative claims and the premium costs thereof shall be Station costs to be borne by the Owners

separately (but not jointly) in proportion to their Ownership Shares. All insurance shall contain a waiver of subrogation clause against the other parties hereto.

Section 8.02. Claims cognizable under workers compensation acts or temporary disability benefits laws or any other benefits under workers compensation or analogous statutes and the expenses of defending or disposing of the same, attributable to the ownership or operation of the Station, which are not covered in full by insurance procured in accordance with the preceding paragraph shall (to the extent not covered by such insurance) be treated as Station costs to be borne by the Owners separately (but not jointly) in proportion to their Ownership Shares.

Section 8.03. All losses, damages, expenses, penalties, liabilities and claims (including those in respect of property damages and personal injury but not including derivative claims) asserted by third parties in connection with, or arising out of, the construction, operation, maintenance, repair, decontamination and decommissioning of the Station or any portion thereof, and the expenses of defending against or disposing of the same, attributable to any property, policy, system, design or process in existence at or prior to the time that responsibility for the operation, maintenance, repair, decontamination or decommissioning of the Station is transferred to the Operating Corporation or is developed

after the transfer, or which is attributable to any employee transferred to the Operating Corporation by any Owner, or by any employee hired by the Operating Corporation after the transfer of authority to the Operating Corporation, and which are not covered in full by insurance procured in accordance with the Insurance Memorandum executed by the Owners on December 28, 1981 (or any successor insurance arrangement) shall (to the extent not covered by such insurance) be treated as Station costs to be borne by the Owners severally (but not jointly) in proportion to their Ownership Shares.

Section 8.04. The Owners have heretofore been acting for their mutual benefit, at cost and without opportunity for profit, in connection with the Station, pursuant to the terms of the Ownership Agreement. In recognition of that fact, the Owners accept "AS IS" the condition of the property of the Station, the employees transferred to the Station and any policy, system, design or process developed for the construction, operation, maintenance, repair, decontamination and decommissioning of the Station. Each of the Owners hereby expressly waives (on behalf of itself and its successors and assigns and anyone claiming an interest on behalf of or through said Owner) any right it may have to recover for any cause (including negligence), from any other Owner for any losses, damages, liabilities, penalties, fines, claims or expenses (including, without limitation, damages to the property of the Station, purchase of replacement power, and the costs of

repairing, decontaminating or decommissioning such property) including, but not limited to, those caused by any property, policy, system, design or process in existence at or prior to the time that responsibility for the operation, maintenance, repair, decontamination or decommissioning of the Station is transferred to the Operating Corporation, or by any employee transferred to the Operating Corporation by any Owner.

Section 8.05. Each Owner shall take all action necessary and appropriate to provide indemnification proportionate to its Ownership Share to the Operating Corporation and to all directors, officers, employees and agents of the Operating Corporation to the full extent permitted by law. The action taken by each Owner shall be subject to the approval of the other Owners.

Section 8.06. If any Owner, by reason of joint or several liability or otherwise, shall be required to make any payment or incur any obligations attributable to the construction, operation, maintenance, repair, decontamination or decommissioning of the Station in excess of its respective Ownership Share, the other Owners shall indemnify and reimburse such Owner proportionately to their Ownership Shares to the extent of any such excess together with interest on such excess (for the period between the payment by the Owner to be so indemnified and its receipt of such indemnification), at a rate substantially equivalent and pursuant

to the indemnified Owner's overall rate of return allowed in the last rate case of such Owner; except that with respect to KEPCo (inasmuch as it has no overall rate of return) such rate shall be substantially equivalent and pursuant to KEPCo's total cost of funds.

ARTICLE 9

Miscellaneous

Section 9.01. Nothing in this Agreement shall be deemed to create or constitute a partnership, joint venture or association among the parties hereto or any of them, the sole purpose of this Agreement being limited to provision for the orderly and efficient operation, maintenance, repair, decontamination and decommissioning of the Owners' respective separate and undivided tenancy-in-common interests in the Station.

Section 9.02. Any notice, demand, or request for consent, provided for in this Agreement or made in connection herewith, shall be deemed to be properly served upon an Owner or the Operating Corporation if given in writing and delivered in person or sent by registered or certified mail, postage prepaid, addressed to the chief executive officer of the Owner or the Operating Corporation at its then principal office.

Section 9.03. Each Owner shall determine the basis and method it will use for purposes of depreciation and other matters where investment in Station property is relevant.

ARTICLE 10

Binding Effect; Amendments and Modifications

Section 10.01. This Agreement shall become effective as provided for in Section 10.03 hereof. This Agreement shall terminate concurrently with the termination of the Ownership Agreement, unless it shall have been previously terminated by the unanimous agreement of the Owners; provided, however, that this Agreement shall be amended and modified as necessary or appropriate to accommodate an Additional Unit(s) at the Station Site if Ownership Interests in the Common Facilities at the Station are to be adjusted to reflect the Additional Unit(s) pursuant to the provisions of the Ownership Agreement.

Section 10.02. Any Owner may propose in writing an amendment, modification or supplement to this Operating Agreement. No amendments, modifications or supplements shall be effective unless and until so proposed to and considered by the Owners, reduced to writing, approved and executed by all the Owners and the Operating Corporation, and each of the Owners and the Operating Corporation shall have obtained, in form satisfactory to it and to the other parties hereto, any and all authorization from governmental bodies having jurisdiction over it (or them) for such of the matters provided for in such amendment, modification or supplement as such Owner and/or the Operating Corporation shall deem necessary or appropriate. No amendments affecting the Operating License of the Station shall be effective unless and until approved by the Nuclear Regulatory Commission or any successor agency.

Section 10.03. This Agreement shall become effective upon its execution and when the boards of directors and/or executive committees of each of the Owners and of the Operating Corporation shall have authorized or ratified this Agreement and authorized its implementation, but this Agreement shall not become operative until

I. each of the Owners and the Operating Corporation shall have obtained any and all authorization from governmental bodies having jurisdiction over it (or them) for such of the matters provided for in this Agreement as such Owner and/or the Operating Corporation shall deem necessary or appropriate; or

II. 12:01 A.M., January 1, 1987,

whichever shall last occur. Each of the Owners shall advise the other Owners and the Operating Corporation when these conditions applicable to said Owner shall have been satisfied.

ARTICLE 11

Successors and Assigns

Section 11.01. This Agreement shall inure to the benefit of and be binding upon the successor and assigns of each Owner, and of the Operating Corporation, provided, however, that rights and obligations of an Owner in, or arising from, this Agreement shall not be assigned except in connection with the transfer by an Owner

of an Ownership Share in all or any portion of the Station, in which event the Owner shall assign and shall cause such transferee to assume the related portion of its rights and obligations under this Agreement, all as provided for in Paragraph 3.8 of the Ownership Agreement, and to acquire from such Owner the related shares of capital stock of the Operating Corporation.

ARTICLE 12

Governing Law

Section 12.01. This Agreement has been executed and delivered in the State of Kansas and is intended to be construed in accordance with, and to be governed by, the laws of that State.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed and delivered as of the day and year first above written.

ATTEST:

Asst. Secretary

KANSAS GAS AND ELECTRIC COMPANY

By: _____

ATTEST:

Secretary

KANSAS CITY POWER & LIGHT COMPANY

By: _____

ATTEST:

Secretary

KANSAS ELECTRIC POWER COOPERATIVE, INC.

By: _____

ATTEST:

Secretary

WOLF CREEK NUCLEAR OPERATING CORPORATION

By: _____

Evergy has included the 2017 Catalyst report; the options included in the report have not changed.

Westar & KCP&L
Wolf Creek Nuclear Decommissioning Financing Plan
August 28, 2017

I. Executive Summary

The Wolf Creek Decommissioning Finance Plan ("Plan") Joint Resolution addressing the owners' next triennial filing due September 1, 2017 requires the following section (as noted on page 2 of Attachment 1 of the Joint Status Report and Resolution filed in Docket No. 15-WCNE-093-GIE on February 5, 2016):

V. Financial Responsibility

b. Plans and options for insuring against or otherwise financing premature closing of the facility, including but not limited to:
   i. Plan/options to ensure that the contribution amount set for the decommissioning trust fund for each owner is reasonable given the possibility for premature closing;
   ii. Options to address the potential for a decommissioning trust fund shortfall in the event of premature closing;
   iii. Plan/options to address recovery of depreciation expense for Wolf Creek by the owners; and
   iv. Discussion of regulatory treatment and rate recovery options that would ensure that owners fully recover their investment and return on their investment even in the event of a premature closing including rate adjustments in current rate periods or continued rate recovery after the plant is closed.

Overall, Westar and KCP&L (collectively "the Companies")[1] are proposing three (3) options:

- The first option is to maintain the current schedules for the trust fund contributions and depreciation expense. This option is appropriate if Wolf Creek does not experience a premature plant closure; however, this option limits the flexibility of the Companies and the Commission to respond to changing circumstances -- which increases the overall risk, particularly given the trend of nuclear plant closures across the country.
- The second option is to revise the schedules for trust fund contributions and depreciation expense to reflect a premature plant closure by aligning those schedules with the shortened remaining operating life of the plant.
- A third option (which could operate in conjunction with the second option) is to establish a standalone ratemaking mechanism (i.e. a balancing account and tracker) to ensure that the actual costs of a premature plant closure are recovered subject to full Commission review and approval.

More specifically to Section V noted above, the Companies propose that for (i) and (ii), the primary option for ensuring that the decommissioning trust fund is fully funded in the event of a premature plant closure is to recalculate the contribution amount upon approval of the plan to prematurely close the plant. This revision would ensure a reasonable level of contribution without undue delay or incremental risk, while aligning the period of time over which the decommissioning trust fund is funded with the remaining depreciable life of the plant.

The Companies also propose that for (iii) and (iv), an option to address the recovery of depreciation expense in the event of a premature closing would be for the Companies to revise depreciation rates to reflect the shortened remaining operating life of the plant, pursuant to the direction and approval of the Commission. Another option is to establish a balancing account which operates in conjunction with a rate mechanism or "tracker" to ensure that the actual costs associated with premature plant closure are recovered, subject to Commission review and approval. These options allow the Commission to closely manage the rate impacts of premature plant closure while simultaneously providing the Commission more flexibility in the future to address the financial and rate impacts of unforeseen operational issues or market conditions that may induce the premature closure of the plant.

[1] KEPCo concurs in this discussion of the options to address the potential for a decommissioning trust fund shortfall in the event of a premature closing. Like its Wolf Creek co-owners, KEPCo's decommissioning funding plan is subject to the Commission's approval. However, unlike its Wolf Creek co-owners, KEPCo's rates are not subject to the Commission's approval - they are instead set by KEPCo's member-owners.

II. Discussion

i. Plan/options to ensure that the contribution amount set for the decommissioning trust fund for each owner is reasonable given the possibility for premature closing.

ii. Options to address the potential for a decommissioning trust fund shortfall in the event of premature closing.

The primary method for ensuring that the contribution amount set for the decommissioning trust fund is reasonable is to plan to recalculate the contribution amount upon approval of the plan to prematurely close the plant. This recalculation of decommissioning trust fund contributions – at the time the plan for premature plant closure is approved, rather than on a rigid three-year periodicity – would ensure a reasonable level of contribution without undue delay or incremental risk. For accounting and ratemaking purposes, it is important that the period of time over which the decommissioning trust fund is fully funded closely aligns with the remaining depreciable life of the plant.

Another option would be to increase the trust fund contributions *before* the decision to prematurely close the plant is approved – i.e. in the next triennial filing and/or next rate case – to mitigate the risk that the decommissioning trust fund balance would be insufficient to meet actual decommissioning costs in the event of a premature closure. This option places emphasis on reducing ratepayer risk by ensuring that funds are available well before the currently-anticipated plant closure date. This option gives the Commission more flexibility around the contribution level and the corresponding rate impact, because it allows increased contributions to the trust fund to be made over a greater number of years. The disadvantages of this option are twofold; first, there is a fair degree of uncertainty around when the premature closing would take place (if at all), which complicates the calculation of an increased trust fund contribution. Second, this approach could be inconsistent with the matching principle (which requires the cost of capital investments to be spread over the time period in which those investments will be used).

iii. Plan/options to address recovery of depreciation expense for Wolf Creek by the owners.

One option to address the recovery of depreciation expense for Wolf Creek in the event of a premature closing would be for the Companies to revise depreciation rates to reflect the shortened remaining operating life of the plant, pursuant to the direction and approval of the Commission. This may be the best option available because it allows the Commission to closely manage the rate impacts of premature plant closure while simultaneously providing the Commission more flexibility in the future to address the financial and rate impacts of unforeseen operational issues or market conditions that may induce the premature closure of the plant.

It would be beneficial to shorten the depreciable life of the plant and revise the depreciation schedule immediately following the approval of a premature closing because (1) doing so would result in the appropriate matching of cost recovery with the remaining operating life of the plant and (2) revising the depreciation schedule at that time would mitigate future rate impacts associated with the earlier closure of the plant. In other words, any delay would only serve to increase the future rate impacts.

By revising depreciation rates to reflect a revised closure date, the recovery of Wolf Creek-related costs would align with the remaining operating life of the plant, resulting in cost recovery from customers who are served by the plant.

Another option is the establishment of a balancing account and rate tracker mechanism for all of the costs related to Wolf Creek. Because of the cost uncertainties that would exist at the time the premature closing was under consideration, the Companies could propose the establishment of a balancing account that would allow flexibility for the timing and recovery of the then-remaining Wolf Creek revenue requirement.

Under this scenario, each of the Companies would remove all of the costs related to Wolf Creek from base rates. Then each of the Companies would establish a balancing account and book all of the costs related to Wolf Creek to that account. The Companies would then project a present value of revenue requirements for Wolf Creek over the remaining life of the plant and could include the levelized

revenue requirement amount in the tracker. Then a periodic comparison of actual costs and projected costs could take place, annually or otherwise, to update the levelized revenue requirement and to determine whether any revisions to the tracker amount would be required. This would allow for the "smoothing" of the rate impacts of costs relate to the premature closure of the plant.

The mechanism itself could operate in a number of ways, subject to Commission direction. (For example, the tracker could be used to recover the entire Wolf Creek revenue requirement, with none of those amounts in base rates; or, a portion of the Wolf Creek revenue requirement could remain in base rates, and the tracker could be used to recover any incremental amounts.) Regardless of the specific design of the tracker and how it is administered, the general concept of matching customer rates with actual costs over the remaining life of the plant – closely managing the risks of future rate impacts while providing the Commission with a high degree of flexibility should a premature plant closing occur – would remain.

There are at least three types of costs the Companies would anticipate booking to the balancing account for this tracker: (1) the depreciation associated with existing plant investments, (2) the return on the undepreciated capital investments at the plant until its end-of-life, and (3) decommissioning costs related to the plant shutdown. There could be other types of costs to be identified later to also be booked in the balancing account.

The balancing account would smooth revenue requirement impacts of a premature closure over whatever plant life would remain and would allow for full recovery of actual plant-related costs (but no more than those actual costs) by its end-of-life. This would effectively align the cost recovery period with the remaining operating life of the plant, resulting in an appropriate matching of cost recovery from customers who benefit from the plant's operations while mitigating the risk of future customers bearing the costs of a plant that will no longer be providing service. Additionally, through the proposed accounting treatment, customers would pay no more and no less than the actual fixed costs of operating the plant between the time that plans for the premature closure are approved and the actual date of closure. Periodic reviews would ensure both the prudency of costs incurred and the accuracy of any rate adjustments that stem from such reviews.

This approach has been approved via settlement by a state regulator in another jurisdiction for the premature closure of a power plant.[2]

iv. Discussion of regulatory treatment and rate recovery options that would ensure that owners fully recover their investment and return on their investment even in the event of a premature closing including rate adjustments in current rate periods or continued rate recovery after the plant is closed.

In addition to the options discussed in (iii) above, the Companies could propose the deferral of the then-remaining Wolf Creek depreciation expense. This approach has been approved by a state regulator in another jurisdiction for the long-term idling of power plants.[3] The Companies could then propose the inclusion of those deferred amounts, amortized over an as-yet-undetermined number of years, in the Companies' revenue requirement to be recovered in base rates. This approach is not consistent with the matching principle. However, this approach could potentially mitigate adverse rate impacts, so that a balance could be struck between the matching principle and the ratemaking principle of gradualism.

Perhaps the best option would be to create a rate mechanism aimed at recovering all of the costs associated with the Wolf Creek investment and the return on that investment, as described in the response to (iii). The rate mechanism would operate in conjunction with base rates to recover the applicable amounts. The rate mechanism could be used to recover the incremental revenue requirement not included in base rates at the time the mechanism is established. This approach would permit the review of particular cost items related to the Wolf Creek premature closure in a separate proceeding, outside of a rate case and with greater frequency (e.g. annually). The particular details of how the mechanism would operate would have to be determined at the time the mechanism is proposed, presumably at or shortly after the approval of the plan to prematurely close the plant.

[2] See Idaho Public Utilities Commission, *In The Matter Of The Application Of Idaho Power Company For Authority To Increase Its Rates For Electric Service To Recover Costs Associated With The North Valmy Plant,* Case No. IPC-E-16-24, Order No. 33771 (May 31, 2017).

[3] See Kentucky Public Service Commission, *In the Matter Of: Application Of Big Rivers Electric Corporation For A General Adjustment In Rates Supported By Fully Forecasted Test Period*, Case No. 2013-00199 (April 25, 2014).

Financial Responsibility

In support of K.S.A. 66-128m (b)(8):

1. Reasonable assurance of responsibility in the event of insufficient assets to fund the decommissioning.

Ultimately customers are responsible for the costs for decommissioning of Wolf Creek and the utilities maintain the right to collect those costs from customers over a reasonable period of time. If there are some timing differences in recovery of costs from customers, the utilities have sufficient credit quality to ensure funds are available to complete decommissioning, as discussed for each utility below.

Evergy Kansas South Response

We believe the financial condition of Evergy, Inc. and its wholly owned subsidiary, Evergy Kansas South, provides reasonable assurance of the availability of funds. Standard and Poor's current Corporate Credit Ratings for both Evergy, Inc. and Evergy Kansas South are A- with a Negative outlook. Moody's current Senior Unsecured Debt rating for Evergy, Inc. is Baa2/Stable and Moody's Corporate Credit Rating for Evergy Kansas South is Baa1/Stable. As investment grade entities, Evergy, Inc. and Evergy Kansas South both have access to the capital markets. Other available sources of funds include internally generated cash and short-term borrowing. Evergy maintains a $2.5 billion master credit facility under which Evergy, Inc. and Evergy Kansas South (through its parent, Evergy Kansas Central, Inc.) each have borrowing capacity with specific sublimits for each borrower. These sublimits can be unilaterally adjusted by Evergy for each borrower provided the sublimits remain within minimum and maximum sublimits as specified in the facility. Each entity may use the credit facility as back-up for issuing commercial paper as well. These credit facilities alone provide the ability for Evergy Kansas South to sufficiently fund the required annual contribution necessary to meet Evergy Kansas South's projected decommissioning costs.

Evergy Metro Response

We believe the financial condition of Evergy, Inc. and its wholly owned subsidiary, Evergy Metro, provides reasonable assurance of the availability of funds. Standard and Poor's current Corporate Credit Rating for Evergy, Inc. is A- with a Negative outlook and it is A with a Negative outlook for Evergy Metro. Moody's current Senior Unsecured Debt rating for Evergy, Inc. is Baa2 with a Stable outlook and Moody's Corporate Credit Rating for Evergy Metro is Baa1 with a Stable outlook. As investment grade entities, Evergy, Inc. and Evergy Metro both have access to the capital markets. Other available sources of funds include internally generated cash and short-term borrowing. Evergy maintains a $2.5 billion master credit facility under which Evergy, Inc. and Evergy Metro each have borrowing capacity with specific sublimits for each borrower. These sublimits can be unilaterally adjusted by Evergy for each borrower provided the sublimits remain within minimum and maximum sublimits as specified in the facility. Each entity may use the credit facility as back-up for issuing commercial paper as well. These credit facilities alone provide the ability for Evergy Metro to sufficiently fund the required annual contribution necessary to meet the Kansas jurisdictional requirement of Evergy Metro's projected decommissioning costs.

Financial Responsibility

In support of K.S.A. 66-128m (b)(8):

1. Reasonable assurance of responsibility in the event of insufficient assets to fund the decommissioning.

KEPCo Response

KEPCo has contracts with its member owners that extend through 2045 that obligate those member owners to pay the costs incurred by KEPCo in providing power to them. Those costs include decommissioning costs. Other available sources of funds include short term borrowing and existing credit facilities.

ATTACHMENT 6

Periodic Review

Periodic Review

Evergy Kansas Metro, Evergy Kansas Central, and KEPCo will continue reviewing the Decommissioning Plan, including the estimated cost of decommissioning every three years.

ATTACHMENT 7

Commission Requested Information

Nuclear Waste Fund and
U.S. Department of Energy ("DOE") Lawsuit History

The Commission requested additional background information on (i) the Nuclear Waste Fund and (ii) the DOE lawsuit history, namely the case of Nuclear Energy Institute, KGE, KCPL, KEPCo, WCNOC, et al. v. US Dept. of Energy (US Court of Appeals for the D.C. Circuit, Case No. 11-1068, filed March 8, 2011. Consolidated on March 10, 2011, with National Association of Regulatory Utility Commissioners v. US Dept. of Energy, Case No. 11-1066 filed on March 7, 2011.) (the "DOE Lawsuit").

The Nuclear Waste Policy Act of 1982 ("Act") created a timetable and procedure for establishing a permanent, underground repository for spent fuel from civilian nuclear reactors and other high-level radioactive waste ("Repository") by the mid-1990s.

Various governmental agencies were assigned responsibility for various activities in connection with the repository. The DOE was tasked with siting, constructing, operating, and closing the Repository and established an Office of Civilian Radioactive Waste Management to implement the Act. The U.S. Environmental Protection Agency ("EPA") was responsible for setting public health and safety standards for releases of radioactive materials from the Repository, and the U.S. Nuclear Regulatory Commission ("NRC") was to promulgate regulations governing construction, operation, and closure of a repository.

The cost of constructing an operating the Repository would be financed from a Nuclear Waste Fund composed of fees levied against nuclear electric utilities. Initially, the fee was set at 1.0mill/kWh of nuclear electricity generated. The Nuclear Waste Fund has accrued fees and interest and currently has an unspent balance in excess of $35 billion (approximately $11 billion has been spent to date).

In 2011, the Nuclear Energy Institute and multiple nuclear utilities filed the DOE Lawsuit to suspend collection of fees following the government's decision to discontinue developing Yucca Mountain and its failure to pursue an alternative waste management and disposal program.

Initially, the D.C. Circuit in June 2012 ruled that the fee was unlawful, and ordered the DOE to conduct a reevaluation of the Nuclear Waste Fund and report back to the court within six months. In January 2013, the DOE submitted a 180-page report, determining that "neither insufficient nor excess revenues are being collected in order to recover the costs incurred by the Federal Government" and unveiled a waste disposal strategy that called for a phased, consent-based approach to siting and implementing a nuclear waste management and disposal system and endorsed building a pilot interim storage facility by 2021.

NEI and the utilities challenged the report. A D.C. Circuit decision on November 19, 2013 found that DOE's termination of the Yucca Mountain repository program prevented the agency from determining whether an appropriate fee was being collected. With no ability to assess a fee to offset the cost of an actual waste management and disposal program, the court ordered the DOE to submit a proposal to Congress to change the Nuclear Waste Fund fee to zero "until such time as either the Secretary chooses to comply with the Act as it is currently written, or until Congress

enacts an alternative waste management plan".

On December 20, 2013, the DC Circuit rejected the DOE' s motion to enlarge the time within which to request rehearing of the D.C. Circuit decision and granted the petitioners' motion to issue the mandate for suspension of the Nuclear Waste Fund fees "forthwith". On January 3, 2014, the DOE submitted a proposal to Congress that the fee be set at zero, effective after Congress had been in session for 90 consecutive days unless Congress disapproved the proposal. On March 18, 2014, the DC Circuit rejected the DOE request for the DC Circuit to rehear the case *en banc* (i.e. all judges of the DC Circuit would participate). The fee reduced to 0.0mill/kWh as of May 16, 2014, once the 90-day period elapsed. The fee currently remains at 0.0mill/kWh.

It remains possible that the federal government will not have removed all of Wolf Creek's spent nuclear fuel and high-level radioactive waste from the station by the time the plant has been decommissioned.

U.S. DECOMMISSIONING EXPERIENCE TO DATE

PROVIDED AS KANSAS CORPORATION COMMISSION
REQUESTED INFORMATION UNDER DOCKET 15-WCNE-093-GIE

SEE APPENDIX G TO TLG REPORT (ATTACHMENT 2)