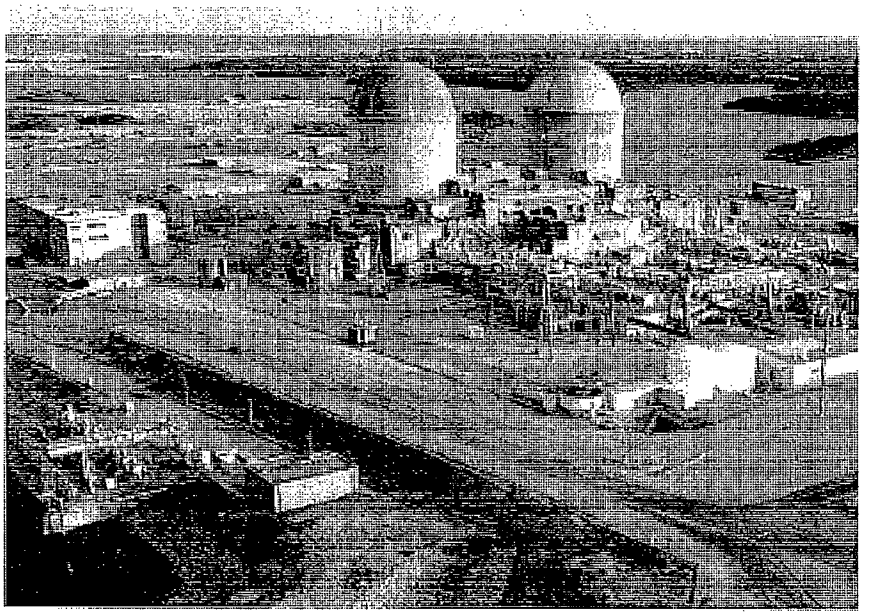
Attachment A

DECOMMISSIONING COST STUDY

for the

COMANCHE PEAK NUCLEAR POWER PLANT



prepared for

Luminant Generation Company LLC

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TABLE OF ACRONYMS / ABBREVIATIONS

AIF/NESP-036	Atomic Industrial Form document delineating a standardized cost estimating model for decommissioning
ALARA	As-Low-As-Reasonably-Achievable
Comanche Peak	Comanche Peak Nuclear Power Plant
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (also referred to as Superfund)
CFR	Code of Federal Regulations
DECCER	TLG's Proprietary Decommissioning Cost Model
DECON	Prompt Decommissioning (NRC Acronym)
DOC	Decommissioning Operations Contractor
DOE	Department of Energy
ENTOMB	Entombment or Hardened Storage (NRC Acronym)
EPA	Environmental Protection Agency
FSAR	Final Safety Analysis Report
GTCC	Greater-than-Class C (as defined by 10 CFR §61)
IP	Industrial Package
ISFSI	Independent Spent Fuel Storage Installation
LSA	Low Specific Activity
LTP	License Termination Plan
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
Luminant	Luminant Generation Company LLC
MOU	Memorandum of Understanding (between NRC and EPA)
MPC	Multi-Purpose Canister
MTU	Metric Tons of Uranium
NRC	Nuclear Regulatory Commission (or Commission)
NSSS	Nuclear Steam Supply System
NWPA	Nuclear Waste Policy Act
PERT	Program Evaluation and Review Technique
PSDAR	Post-Shutdown Decommissioning Activities Report
SAFSTOR	Passive Storage (NRC Acronym)
SCO	Surface Contaminated Object
TEDE	Total Effective Does Equivalent
WDF	Work Difficulty Adjustment Factors

REVISION LOG

No.	Date	Item Revised	Reason for Revision
0	06-09-2010		Original Issue

EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Comanche Peak Nuclear Power Plant (Comanche Peak) for the selected decommissioning alternatives. The analysis relies upon site-specific, technical information from an evaluation prepared in 2005,[1] updated to reflect current assumptions pertaining to the disposition of the two nuclear units and relevant industry experience in undertaking such projects. The station inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis. The plant confirmed that there were no substantive changes over the four year period to the configuration of the plant or site facilities (that would impact decommissioning).

The current estimates are designed to provide Luminant Generation Company LLC (Luminant) with sufficient information to assess its financial obligations, as they pertain to the decommissioning of the nuclear station. The estimates do not reflect the actual plan to decommission all aspects of Comanche Peak; the plan may differ from the assumptions made in the cost estimates based on facts that exist at the time of the decommissioning activity.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the operating licenses for the nuclear units can be terminated. The analysis recognizes that spent fuel will be stored at the site in the wet storage pools and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to the U.S. Department of Energy (DOE). Consequently, the estimates also include those costs to manage and subsequently decommission these interim storage facilities.

The currently projected cost to promptly decommission the station (DECON alternative), manage the spent fuel, and restore the site, is estimated at $1,224.4 million, as reported in 2009 dollars. The cost to defer decommissioning by placing the unit in safe-storage (SAFSTOR alternative) for approximately 50 years is estimated at $1,420.9 million, as reported in 2009 dollars.

The estimates 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 estimates incorporate a minimum cooling period for the spent fuel that resides in the storage pools when operations cease. Once sufficiently cooled

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1 "Decommissioning Cost Analysis for the Comanche Peak Steam Electric Station," Document T04-1471-002, Rev. 1, TLG Services, Inc., May 2005

the spent fuel is transferred to the DOE or to the ISFSI for interim storage. The estimates also include the dismantling of site structures and non-essential facilities and the limited restoration of the site.

Alternatives and Regulations

The ultimate objective of the decommissioning process is to reduce the inventory of contaminated and activated material so that the license can be terminated. The Nuclear Regulatory Commission (NRC) provided initial decommissioning requirements in its rule adopted on June 27, 1988.[2] In this rule, the NRC set forth financial criteria for decommissioning licensed nuclear power 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."[3]
>
> 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."[4] Decommissioning is to be completed within 60 years, although longer time 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."[5] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years.

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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, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

3 Ibid. Page 24022, Column 3

4 Ibid.

5 Ibid. Page 24023, Column 2

> 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 NRC directed its staff 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, for example, on engineered barriers.

In 1996, the NRC published revisions to the 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.[6] 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, further described the methods and procedures acceptable to the NRC staff for implementing the requirements of the 1996 revised rule relating to the initial activities and major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and processes described in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.[7]

Comanche Peak Decommissioning Scenarios

Two decommissioning scenarios were evaluated for the Comanche Peak nuclear units. The scenarios selected are representative of alternatives available to the owner and are defined as follows:

1. The first scenario assumes that the units would be promptly decommissioned (DECON alternative) upon the expiration of the current operating licenses, i.e., 2030 and 2033 for Units 1 and 2, respectively. Spent fuel in wet storage pools at that time would be relocated to the ISFSI for interim storage until such time that the DOE can complete the transfer.

2. In the second scenario, the nuclear units are placed into safe-storage (SAFSTOR alternative) at the end of their current operating license. Spent fuel in wet storage pools at that time would be relocated to the ISFSI for interim storage so

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6 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

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

as to minimize caretaking costs. The fuel would be transferred to the DOE (consistent with the assumptions in the DECON scenario) until the process is complete. At that time, the ISFSI would also be placed in safe-storage. Decommissioning is deferred to the maximum extent (approximately 50 years) such that the licenses are terminated within the generally required 60-year period.

Methodology

The methodology used to develop the estimates described within this document follows the basic approach originally presented in the cost estimating guidelines[8] developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit factor method for determining decommissioning activity costs. The unit factors used in this analysis incorporate site-specific costs and the latest available information on worker productivity in decommissioning.

The estimates also reflect lessons learned from TLG's involvement in the Shippingport Station decommissioning, completed in 1989, and the decommissioning of the Cintichem reactor, hot cells and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Connecticut Yankee and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and technical challenges of decommissioning commercial nuclear units.

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.

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."[9] 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

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

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

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 nuclear units.

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 Disposal

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,[10] and its Amendments of 1985,[11] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. However, with the exception of Texas (which has issued a license for a new facility), no new compact facilities have been successfully sited, licensed, and constructed.

Until recently, there were two facilities available to Luminant for the disposal of low-level radioactive waste generated by Comanche Peak. As of July 1, 2008, however, the facility in Barnwell, South Carolina was closed to generators outside the Atlantic Compact (comprised of the states of Connecticut, New Jersey and South Carolina). This leaves the facility in Clive, Utah, operated by EnergySolutions, as the only currently available destination for low-level radioactive waste requiring controlled disposal, until the construction of Waste Control Specialist's facility in Andrews County is complete.

For the purpose of this analysis, the current disposal agreement with EnergySolutions is used as the basis for estimating the disposal cost for the majority of the radioactive waste (Class A [12]). EnergySolutions does not have a license to dispose of the more highly radioactive waste (Classes B and C), for example, generated in the dismantling of the reactor vessel. As a proxy, the disposal cost for this material is based upon the last published rate schedule for non-compact waste for the Barnwell facility.

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.,

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10 "Low-Level Radioactive Waste Policy Act of 1980," Public Law 96-573, 1980.

11 "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1986.

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

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. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. For purposes of this analysis, the GTCC radioactive waste is assumed to be packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

For purposes of this study, GTCC is assumed to be packaged in the same canisters used for spent fuel. The GTCC material is either stored on site or shipped directly to a DOE 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 for Comanche Peak reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act"[13] (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel and high level radioactive waste created by the commercial nuclear generating plants to the DOE. The NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. The NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level

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

waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's breach of contract.

The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct a geologic repository at Yucca Mountain, Nevada. The current Administration, however, has stated its intention to eliminate future funding for the project and, as a result, DOE has filed a motion to withdraw its application. Under the President's proposed plan, a Blue Ribbon Commission would evaluate options and make recommendations to the Administration for developing a new plan for the ultimate disposition of high level waste. Until such a plan is formulated, however, the cost of managing the spent fuel until the DOE is able to complete the transfer to an interim or permanent disposal site is based upon the information available and relied upon in the previous study.

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 Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).[14] This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimates, for example, construction and operation of the ISFSI and continued operation of the spent fuel pools.

The spent fuel pools are expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core at shutdown. Over the following five and one half years the assemblies are packaged into multi-purpose canisters (MPCs) for transfer to the DOE or to the ISFSI for interim storage. It is assumed that this period provides the necessary cooling for the final core to meet the transport and/or storage requirements for decay heat.

DOE's contracts with utilities order the acceptance of spent fuel from utilities based upon the oldest fuel receiving the highest priority. However, the DOE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shutdown nuclear reactors. Because it is unclear how these mechanisms may operate once DOE begins accepting spent fuel from commercial reactors, this study conservatively assumes that DOE will accept spent fuel in an oldest fuel first order. For purposes of this analysis, the first assemblies removed from the Comanche Peak site are

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

conservatively assumed to be in 2025 based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1, 3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond. With an estimated, maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is conservatively projected to be in the year 2064. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the Comanche Peak site until the year 2064.

Luminant's position is that the DOE has a contractual obligation to accept Comanche Peak's fuel far 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. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed earlier.

An ISFSI, which can be operated under a separate and independent license, will be constructed to support management of the spent fuel at the site until the DOE is able to complete the transfer to a federal repository. As such, the fuel that cannot be transferred directly to the DOE from the wet pools is packaged for interim storage at the ISFSI. This will allow decommissioning to continue on the nuclear units.

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 will substantially damage power block structures, potentially weakening the footings and structural supports. Prompt dismantling of site structures (once the facilities are decontaminated) is clearly the most appropriate and cost-effective option. 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 on site is more efficient than if the process is deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and the demolition work force. Consequently, this study assumes that site structures are removed to a nominal depth of three feet below the local grade level wherever possible. The site is then to be graded and stabilized.

Summary

The cost to decommission Comanche Peak assumes 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 fuel storage facilities can be decommissioned (DECON alternative) or placed in storage and decommissioned with the reactor complex (SASFTOR alternative).

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 manpower requirements delineated in Appendices C and D for the DECON and SAFSTOR alternatives. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates are assigned to one of three subcategories: NRC License Termination, 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 Part 50.75). The cost reported for this subcategory is generally sufficient to terminate the operating licenses for the two reactors, recognizing that there may be some additional cost impact from spent fuel management. This subcategory also includes the costs of disposing of the retired steam generators and the reactor vessel closure head from Unit 1. The study assumes that the disposal of the components would occur after shutdown, however, the costs are identified separately because the disposal activities could be conducted at anytime.

The "Spent Fuel Management" subcategory contains costs anticipated to be incurred once the nuclear units cease operation for the off-loading of the pools either directly to the DOE or to the ISFSI for interim storage, and the eventual transfer of casks from the ISFSI to the DOE. Costs are also included for the operation of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., geologic repository) is complete.

"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., ARO 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 2009 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 station or during the decommissioning period.

DECON COST SUMMARY
DECOMMISSIONING COST ELEMENTS
(thousands of 2009 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	9,905	15,039	24,945
Removal	75,849	121,217	197,066
Packaging	15,695	15,202	30,897
Transportation	7,102	5,850	12,952
Waste Disposal	74,142	71,595	145,737
Off-site Waste Processing	18,476	23,278	41,754
Program Management [1]	245,141	299,888	545,029
Spent Fuel Pool Isolation	11,143	7,429	18,572
Spent Fuel Management (Direct Costs) [2]	53,286	50,479	103,765
Insurance and Regulatory Fees	15,336	12,141	27,477
Energy	7,900	8,313	16,214
Characterization and Licensing Surveys	10,902	10,529	21,432
Property Taxes	3,507	3,211	6,718
Miscellaneous Equipment	6,338	6,673	13,012
Decommissioning Staff Severance	9,434	9,434	18,868
Total [3]	564,156	660,280	1,224,435

Cost Element			
License Termination (excluding retired large components)	401,676	488,483	890,160
Large Components (retired) [4]	19,547	1,993	21,540
Spent Fuel Management	103,031	100,224	203,255
Site Restoration	39,902	69,579	109,481
Total [3]	564,156	660,280	1,224,435

[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
[4] Includes retired steam generators and reactor closure head from Unit 1 and turbine rotors from Unit 2

SAFSTOR COST SUMMARY
DECOMMISSIONING COST ELEMENTS
(thousands of 2009 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	8,779	15,696	24,474
Removal	78,070	121,629	199,699
Packaging	11,192	10,341	21,532
Transportation	6,279	4,697	10,976
Waste Disposal	50,077	44,319	94,396
Off-site Waste Processing	22,543	28,278	50,821
Program Management [1]	321,379	377,075	698,454
Spent Fuel Pool Isolation	11,143	7,429	18,572
Spent Fuel Management (Direct Costs) [2]	49,853	47,046	96,899
Insurance and Regulatory Fees	37,897	34,295	72,192
Energy	16,497	16,783	33,280
Characterization and Licensing Surveys	12,281	11,908	24,190
Property Taxes	6,143	5,848	11,991
Miscellaneous Equipment	15,395	31,098	46,493
Decommissioning Staff Severance	9,199	7,693	16,891
Total [3]	656,727	764,134	1,420,860

Cost Element			
License Termination (excluding retired large components)	505,457	572,837	1,078,294
Large Components (retired) [4]	19,491	1,993	21,484
Spent Fuel Management	91,037	118,908	209,945
Site Restoration	40,741	70,396	111,137
Total [3]	656,727	764,134	1,420,860

[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
[4] Includes retired steam generators and reactor closure head from Unit 1 and turbine rotors from Unit 2

1. INTRODUCTION

This report presents estimates of the costs to decommission the Comanche Peak Nuclear Power Plant, (Comanche Peak) for the selected decommissioning alternatives. The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2005,[1]* updated to reflect current assumptions pertaining to the disposition of the nuclear station and relevant industry experience in undertaking such projects. The plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, was reviewed for this analysis. The plant confirmed that there were no substantive changes over the four year period to the configuration of the plant or site facilities (that would impact decommissioning).

The current estimates are designed to provide Luminant Generation Company LLC (Luminant) with sufficient information to assess their financial obligations, as they pertain to the decommissioning of the nuclear station. It is not a detailed engineering document, but a financial analysis prepared in advance of the detailed engineering that will be required to carry out the decommissioning activity.

1.1 OBJECTIVES OF STUDY

The objectives of this analysis are to present comprehensive estimates of the costs to decommission Comanche Peak, to provide a sequence or schedule for the associated activities, and to identify the waste streams expected from the decontamination and dismantling activities.

For the purposes of this study, the shutdown dates for the two units are assumed to be February 7, 2030 for Unit 1 and February 1, 2033 for Unit 2, based upon the expiration of the current operating licenses.

1.2 SITE DESCRIPTION

Comanche Peak is located in Somervell County in North Central Texas, approximately 65 miles southwest of Dallas-Fort Worth area. The nearest communities are Glen Rose and Granbury, about 4 and 10 miles, respectively, from the site. The station is comprised of two nuclear units that are essentially identical except for certain auxiliary systems.

The nuclear steam supply systems (NSSS) consist of a pressurized water reactor and a four-loop reactor coolant system. Each generating unit has a

* References provided in Section 7 of the document

reference core design of 3612 megawatts (thermal) with a corresponding net electrical rating of 1259 and 1245 megawatts (electric), for Units 1 and 2, respectively, with the reactor at rated power.

Each of the four loops of the reactor coolant system contains a vertical U-tube type steam generator and a single speed centrifugal reactor coolant pump. In addition, the system includes an electrically heated pressurizer, a pressurizer relief tank, and interconnected piping. The reactor coolant system is housed within a containment vessel, a free-standing cylindrical steel structure enclosed by a separate reinforced concrete reactor building. The reactor building is designed to provide biological shielding as well as missile protection for the steel containment vessel. A five-foot annulus space is provided between the containment vessel and reactor building for control of containment external temperatures and pressures and also provides a controlled air volume for filtering and access to penetrations for testing and inspection. The containment shell is anchored to the reactor building foundation with a steel liner plate encased in concrete forming the base of the containment.

Heat produced in the reactor is converted to electrical energy by the steam and power conversion system. A turbine-generator system converts the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy. The turbine generators consist of a tandem (single shaft) arrangement of a double-flow high-pressure turbine and two identical double-flow, low-pressure turbines driving a direct-coupled generator at 1800 rpm. The turbines are operated in a closed feedwater cycle, which condenses the steam. The heated feedwater is then returned to the steam generators. The condenser circulating water system removes heat rejected in the main condensers. The heat is dissipated to Squaw Creek Reservoir.

1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC) 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. The rule also placed limits on the time allowed to complete the decommissioning process. For SAFSTOR, 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. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. At the conclusion of a 60-year dormancy period (or longer for ENTOMB 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 has re-evaluated this 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. However, 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]

The NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the option, disposition of certain waste forms, effectiveness of engineering barriers, and the NRC's current priorities, at least until after the additional research studies are complete. The NRC concurred with the staff's recommendation.

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 operate for their full licensed life. However, shortly after the regulations were enacted, 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 will entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. 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 will include a license termination plan (LTP).

1.3.1 Nuclear Waste Policy Act

Congress passed the "Nuclear Waste Policy Act"[7] (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel and high level radioactive waste created by the commercial nuclear generating plants to the DOE. The NWPA provided that DOE would enter into contracts with utilities in which DOE would promise to take the utilities' spent fuel and high-level radioactive waste and utilities would pay the cost of the disposition services for that material. The NWPA, along with the individual contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to accept any spent fuel or high level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to obtain compensation for DOE's breach of contract.

The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct a geologic repository at Yucca

Mountain, Nevada. The current Administration, however, has stated its intention to eliminate future funding for the project and, as a result, DOE has filed a motion to withdraw its application. Under the President's proposed plan, a Blue Ribbon Commission would evaluate options and make recommendations to the Administration for developing a new plan for the ultimate disposition of high level waste. Until such a plan is formulated, however, the cost of managing the spent fuel until the DOE is able to complete the transfer to an interim or permanent disposal site is based upon the information available and relied upon in the previous study.

It is generally necessary that spent fuel be actively 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 Secretary of Energy, pursuant to 10 CFR Part 50.54(bb).[8] This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimates, for example, construction and operation of an ISFSI and continued operation of the spent fuel pools.

The spent fuel pools are expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core at shutdown. Over the following five and one half years the assemblies are packaged into multi-purpose canisters (MPCs) for transfer to the DOE or to the ISFSI for interim storage. It is assumed that this period provides the necessary cooling for the final core to meet the transport and/or storage requirements for decay heat.

DOE's contracts with utilities order the acceptance of spent fuel from utilities based upon the oldest fuel receiving the highest priority. However, the DOE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shutdown nuclear reactors. Because it is unclear how these mechanisms may operate once DOE begins accepting spent fuel from commercial reactors, this study conservatively assumes that DOE will accept spent fuel in an oldest fuel first order. For purposes of this analysis, the first assemblies removed from the Comanche Peak site are conservatively assumed to be in 2025 based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1, 3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond. With an estimated, maximum rate of

transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is conservatively projected to be in the year 2064. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the Comanche Peak site until the year 2064.

Luminant's position is that the DOE has a contractual obligation to accept Comanche Peak's fuel far 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. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed earlier.

For purposes of this analysis, it is assumed that spent fuel will be packaged for interim storage in casks and canisters of the Holtec Hi-Storm design. This assumption is necessary because the DOE has not yet provided any storage casks, and has not yet identified the details of the canisters or transport casks that it will provide. DOE's canisters and casks are likely to be different than the Holtec system, with different requirements.

An ISFSI, which can be operated under a separate and independent license, will be constructed to support management of the spent fuel at the site until the DOE is able to complete the transfer to a federal repository. As such, the fuel that cannot be transferred directly to the DOE from the wet pools is packaged for interim storage at the ISFSI. This will allow decommissioning to continue on the nuclear units.

1.3.2 Low-Level Radioactive Waste Acts

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,[9] and its Amendments of 1985,[10] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. However, with the exception of Texas (which has issued a license for a new facility), no new compact facilities have been successfully sited, licensed, and constructed.

Until recently, there were two facilities available to Luminant for the disposal of low-level radioactive waste generated by Comanche Peak. As of July 1, 2008, however, the facility in Barnwell, South Carolina was closed to generators outside the Atlantic Compact (comprised of the states of Connecticut, New Jersey and South Carolina). This leaves the facility in Clive, Utah, operated by EnergySolutions, as the only currently available destination for low-level radioactive waste requiring controlled disposal, until the construction of Waste Control Specialist's facility in Andrews County is complete.

For the purpose of this analysis, the current disposal agreement with EnergySolutions is used as the basis for estimating the disposal cost for the lowest level and majority of the radioactive waste (Class A [11]). EnergySolutions does not have a license to dispose of the more highly radioactive waste (Classes B and C), for example, generated in the dismantling of the reactor vessel. As a proxy, the disposal cost for this material is based upon the last published rate schedule for non-compact waste for the Barnwell facility.

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 (Greater-than Class C or 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. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. For purposes of the estimates, the GTCC radioactive waste is assumed to be packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

For purposes of this study, GTCC is assumed to be packaged in the same canisters used for spent fuel. The GTCC material is either stored on site or shipped directly to a DOE 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 for Comanche Peak 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,"[12] 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 Comanche Peak 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).[13] An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.[14]

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)[15] 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 Comanche Peak based upon the 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 the Comanche Peak nuclear units. The scenarios selected are representative of alternatives available to the owner and are defined as follows:

1. The first scenario assumes that the units would be promptly decommissioned (DECON alternative) upon the expiration of the current operating licenses, i.e., 2030 and 2033 for Units 1 and 2, respectively. Spent fuel in wet storage pools at that time would be relocated to the ISFSI for interim storage until such time that the DOE can complete the transfer.

2. In the second scenario, the nuclear units are placed into safe-storage (SAFSTOR alternative) at the end of their current operating license. Spent fuel in wet storage pools at that time would be relocated to the ISFSI for interim storage so as to minimize caretaking costs. The fuel would be transferred to the DOE (consistent with the assumptions in the DECON scenario) until the process is complete. At that time, the ISFSI would also be placed in safe-storage. Decommissioning is deferred to the maximum extent (approximately 50 years) such that the licenses are terminated within the generally required 60-year period.

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 Comanche Peak are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the 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.

Engineering and Planning

The PSDAR, required within two years of the notice to cease 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, steam generators, 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 pools and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. The pools will remain operational for approximately five and one half years following the cessation of operations before the inventory resident in the core at shutdown can be transferred to the DOE or to the ISFSI for interim storage.
- 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 termination of the 10 CFR §50 operating license. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. This may 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 may include the upgrading of roads (on- and off-site) to facilitate hauling and transport. Modifications may be required to the containment structure to facilitate access of large/heavy equipment. Modifications may also be required to the refueling area of the building to support the segmentation of the reactor vessel internals and component extraction.
- 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.
- 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.
- 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 former and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments will be 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.

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 NRC. 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.
- Remediation and 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)."[16] 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 final termination of the license.

The NRC will terminate the operating license(s) 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 facility is suitable for release.

2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities will 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, radwaste warehouse and fuel 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 station.

Prompt dismantling of site structures is clearly the most appropriate and cost-effective option. 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 on site is more efficient than if the process were deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public as well as to future workers. Abandonment creates a breeding ground for vermin infestation as well as other biological hazards.

This cost study presumes that non-essential structures and site 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

The ISFSI will continue to operate under a separate and independent license (10 CFR §72) following the termination of the §50 operating licenses. Assuming the DOE starts accepting fuel from the Comanche Peak spent fuel storage pools in 2025, transfer of spent fuel from the ISFSI is anticipated to begin in 2039, and continue through the year 2064.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The NRC will terminate the §72 license when 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.

Spent fuel is stored on the ISFSI in multi-purpose canisters, with a concrete overpack. For purposes of this cost analysis, it is assumed that once the inner canisters containing the spent fuel assemblies have been removed, any required decontamination performed on the storage

overpack (some minor activation is assumed), and the license for the facility terminated, the concrete overpacks 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 pools or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination is 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 they are limited in scope with no large scale dismantling activities anticipated. 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 station in safe-storage includes, but is not limited to, the following activities:

- Isolating 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 of the spent fuel from the storage pools to the DOE or to the ISFSI for interim storage, following the minimum required cooling period in the spent fuel pools.
- 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 with 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 the 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.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/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 provide security. Fire and radiation alarms are also monitored and maintained.

Consistent with the DECON alternative, the spent fuel storage pools are emptied within five and one half years of the cessation of operations. The transfer of the spent fuel to the DOE continues throughout the dormancy period until completed in 2064. Once emptied, the ISFSI is secured for storage and decommissioned along with the power block structures in Period 4.

After an optional 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 an 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 for activities and the writing of activity specifications and detailed 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 availability of the fuel storage facilities for decommissioning.

Variations in the length of the dormancy period are expected to have little effect upon the quantities of radioactive wastes generated from system and structure removal operations. Given the levels of radioactivity and spectrum of radionuclides expected from forty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone, i.e., there is no significant reduction in the waste generated from the decommissioning activities. 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 estimates for this delayed scenario incorporate reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to ^{60}Co will 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 wall 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 can begin. Dismantling, as a continuation of the decommissioning process, is clearly the most appropriate and cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost in this scenario 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 ESTIMATE

The cost estimates prepared for decommissioning Comanche Peak consider the unique features of the site, including the NSSS, power generation systems, support services, site buildings, and ancillary 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 ESTIMATE

The estimates were developed using the site-specific, technical information from the 2005 analysis. This information was reviewed for the current analysis and updated as deemed appropriate. 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,"[17] and the DOE "Decommissioning Handbook."[18] 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 R.S. Means.[19]

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.

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 Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs are assigned to each unique set of unit 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 radiologically controlled areas. The resulting man-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.

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 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS

In estimating the near simultaneous decommissioning of two co-located reactor units there can be opportunities to achieve economies of scale, by sharing costs between units, and coordinating the sequence of work activities. There will also be schedule constraints, particularly where there are requirements for specialty equipment and staff, or practical limitations on when final status surveys can take place. For purposes of the estimates, Units 1 and 2 are assumed to be essentially identical. Common facilities have been assigned to Unit 2. A summary of the principal impacts are listed below.

- The sequence of work generally follows the principal that the work is done at Unit 1 first, followed by similar work at Unit 2. This permits the experience gained at Unit 1 to be applied by the workforce at the second unit. It should be noted however, that the estimates do not consider productivity improvements at the second unit, since there is little documented experience with decommissioning two units simultaneously The work associated with developing activity specifications and procedures can be considered essentially identical between the two units, therefore the second unit costs are assumed to be a fraction of the first unit (~ 43%).
- Segmenting the reactor vessel and internals will require the use of special equipment. The decommissioning project will be scheduled such that Unit 2's reactor internals and vessel are segmented after the activities at Unit 1 have been completed.
- Some program management and support costs, particularly costs associated with the more senior positions, can be avoided with two reactors undergoing decommissioning simultaneously. As a result, the estimates are based on a "lead" unit that includes these senior positions, and a "second" unit that excludes these positions. The designation as lead is based on the unit undertaking the most complex tasks (for instance vessel segmentation) or performing tasks for the first time.
- The final radiological survey schedule is also affected by a two-unit decommissioning schedule. It would be considered impractical to try to complete the final status survey of Unit 1, while Unit 2 still has ongoing radiological remediation work and waste handling in process. As such, the transfer of the spent fuel from the storage pools and subsequent

decontamination of the fuel building is coordinated so as to synchronize the final status survey for the station.

- The final demolition of buildings at Units 1 and 2 are considered to take place concurrently. This is considered a reasonable assumption since access to the buildings is considered good at the station.
- Unit 1, as the first unit to enter decommissioning, incurs the majority of site characterization costs.
- Shared systems and structures are generally assigned to Unit 2.
- Station costs such as emergency response fees, regulatory agency fees, corporate overhead, and insurance are generally allocated on an equal basis between the two units.

3.4 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 and site restoration.

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.

3.4.1 Contingency

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"[20] 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 percentage contingency 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 station.

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%
• Reactor Segmentation	75%
• NSSS Component Removal	25%
• Reactor Waste Packaging	25%
• Reactor Waste Transport	25%
• Reactor Vessel Component Disposal	50%
• GTCC Disposal	15%
• Non-Radioactive Component Removal	15%
• Heavy Equipment and Tooling	15%
• Supplies	25%
• Engineering	15%
• Energy	15%
• Characterization and Termination Surveys	30%
• Construction	15%
• Taxes and Fees	10%
• Insurance	10%
• Staffing	15%

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 Appendix C and D). For example, the composite contingency value reported for the decommissioning activity for the DECON alternative in Appendix C is approximately 18.4% and for the SAFSTOR alternative in Appendix D is approximately 17.1%.

3.4.2 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, for example, the start and rate of acceptance of spent fuel by the DOE.

- Pricing changes for basic inputs such as labor, energy, materials, and 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.

3.5 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that 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.

3.5.1 Spent Fuel Management

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Comanche Peak. 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, the disposal cost is financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. However, the NRC requires 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 funding requirement is fulfilled 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. The timing for removal of spent fuel from the site is based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1, 3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond. The DOE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shutdown nuclear reactors. Because it is unclear how these mechanisms may operate once DOE

begins accepting spent fuel from commercial reactors, this study assumes that DOE will accept spent fuel in an oldest fuel first order.

ISFSI

An ISFSI, which can be operated under a separate and independent license, will be constructed to support management of the spent fuel. The facility is assumed to be available to support spent fuel management until the DOE is able to removal all spent fuel from the site.

The ISFSI will continue to operate throughout decommissioning, and beyond the termination of the operating license in the DECON decommissioning alternative, until such time that the transfer of spent fuel to the DOE can be completed. Assuming, conservatively, that DOE begins to remove spent fuel from the site in 2025, the process is expected to be completed by the year 2064. 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.

Post-shutdown and maintenance costs for the spent fuel pools and the ISFSI are also included and address the cost for staffing the facility, as well as security, insurance, and licensing fees. Costs are provided for the final disposition of the facilities once the transfer is complete.

Canister Design

The HOLTEC Hi-Storm system (with a 32 fuel assembly capacity) is assumed for future cask acquisitions. For fuel transferred directly from the pools to the DOE, the DOE was assumed to provide Transport, Aging and Disposal (TAD) canisters with a 21 assembly capacity. DOE has not provided details about the TAD canisters other than assembly capacity.

Canister Loading and Transfer

The estimates include the cost for the labor and equipment to transfer and load each spent fuel canister into the DOE transport cask or to the ISFSI from the wet storage pools. For estimating purposes only, approximately 50% of this cost is used to estimate the cost to transfer the fuel from the ISFSI into the transport cask. Since the DOE has not published details about its cask system, this rough estimate is

necessary. However, use of this estimate should not be used to infer that TLG has any detailed information on the cask system DOE will ultimately provide.

Operations and Maintenance

The estimates include the cost of operating and maintaining the spent fuel pools and the ISFSI, respectively. Pool operations are expected to continue approximately five and one half years after the cessation of operations. ISFSI operating costs are based upon a 31 year period of operations following the shutdown of Unit 2.

ISFSI Design Considerations

A multi-purpose (storage and transport) dry shielded storage canister (MPC) with a vertical, reinforced concrete storage overpack is used as a basis for the cost analyses. The overpacks are assumed to have some level of neutron-induced activation as a result of the long-term storage of the fuel, i.e., to levels exceeding free-release limits. The cost of the disposition of this material, as well as the demolition of the ISFSI facility, is included in the estimates.

GTCC

The dismantling of the reactor internals may 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 radioactive waste is assumed to be packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel.

For purposes of this study, GTCC is packaged in the same canisters used to store spent fuel. Disposal costs are based upon a cost equivalent to that envisioned for the spent fuel. It is not anticipated that the DOE would 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 Comanche Peak site (for the DECON alternative). In the SAFSTOR alternative, the GTCC material is shipped directly to a DOE facility as it is removed since the fuel has been removed from the site prior to the start of decommissioning.

3.5.2 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 Comanche Peak 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.

3.5.3 Primary System Components

In the DECON alternative, 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 alternative, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

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 disposal

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 outer shell 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.

3.5.4 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.

3.5.5 Retired Components

The estimates include the disposition of four retired steam generators and a retired reactor vessel closure head from Unit 1. The components, currently in storage at the site, will be prepared for transport and disposal. Similar to the disposition of the operating units, the steam domes of the generators are assumed to be removed to meet transport clearances and designated for recycling. The estimates for the retired components include the project management, contractor and supporting costs necessary to execute the tasks assuming that the disposition would be a coordinated effort (i.e., single mobilization effort).

The estimates also include the disposition of one high-pressure and two low-pressure turbine rotors.

The cost for disposition of the retired components is summarized in the tables on pages xvii and xix and in Tables 6.1 and 6.2. While the study assumes that the disposal of the components would occur after shutdown, the costs are identified separately because the disposal activities could be conducted at anytime.

3.5.6 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.[21] The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in subpart 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 Part 71, as Type B. 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 so as 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.

Transportation costs for material requiring controlled disposal are based upon the mileage to the Andrews County facility in western Texas.

Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. Truck transport costs are estimated using published tariffs from Tri-State Motor Transit.[22]

3.5.7 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 and D, 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 Luminant's current cost for disposal at EnergySolutions facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon the last published rate schedule for non-compact waste for the Barnwell facility (as a proxy).

3.5.8 Site Conditions Following Decommissioning

The NRC will 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.

Non-essential structures or buildings severely damaged in decontamination process are removed to a nominal depth of three feet below grade. Concrete rubble generated from demolition activities is processed and made available as clean fill for the power block foundations. Excess construction debris is trucked off site as an alternative to onsite disposal. The excavations will be regraded such that the power block area will have a final contour consistent with adjacent surroundings.

The existing electrical switchyard and access roads will remain in support of the electrical transmission and distribution system. The site access road will be left intact.

The estimates do not assume the remediation of any significant volume of contaminated soil. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

3.6 ASSUMPTIONS

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

3.6.1 Estimating Basis

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.

3.6.2 Labor Costs

The craft labor required to decontaminate and dismantle the nuclear units will be acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis. Costs for site administration, operations, construction, and maintenance personnel are based upon average salary information provided by Luminant.

Luminant will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The owner will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner.

Reductions in the operating organization are handled through normal company practices. No costs have been included for this activity. Severance costs are included for the decommissioning staff as the organization is downsized.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel.

3.6.3 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.[23] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Comanche Peak components, projected operating life, and different periods of decay. Additional short-lived

isotopes were derived from NUREG/CR-0130[24] and NUREG/CR-0672,[25] and benchmarked to the long-lived values from NUREG/CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal.

Activation of the containment building structure is confined to the biological shield. More extensive activation (at very low levels) of the interior structures within containment has been detected at several reactors and the owners have elected to dispose of the affected material at a controlled facility rather than reuse the material as fill on site or send it to a landfill. The ultimate disposition of the material removed from the reactor building will depend upon the site release criteria selected, as well as the designated end use for the site.

3.6.4 General

Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by Luminant 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. Luminant 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, with the exception of 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 and the limits for coverage defined in the NRC's proposed rulemaking "Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors."[26] The NRC's financial protection

requirements are based on various reactor (and spent fuel) configurations.

Taxes

Property taxes are included within the estimates. However, the tax is based upon the land, without any consideration of any ongoing site operations and property assets.

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.

The on-site dike and earthwork network forming water retention ponds and lagoons will be disabled to relieve ongoing inspection requirements.

Site Restoration

All structures will be removed except for the switchyard. The switchyard is required for grid operations. Structures to be removed include but are not limited to the reactor, fuel, auxiliary, radwaste warehouse, safeguard, diesel generator, and turbine buildings.

3.7 COST ESTIMATE SUMMARY

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

Additional tables in Appendices C and D provide detailed costs elements. The cost elements are also 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. This subcategory also includes the costs of disposing of the retired steam generators and the reactor vessel closure head from Unit 1. The study assumes that the disposal of the components would occur after shutdown, however, the costs are identified separately because the disposal activities could be conducted at anytime.

The "Spent Fuel Management" subcategory contains costs anticipated to be incurred once the nuclear units cease operation for the off-loading of the pools either directly to the DOE or to the ISFSI for interim storage, and the eventual transfer of casks from the ISFSI to the DOE. Costs are also included for the operation of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., geologic repository) is complete.

"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.

As discussed in Section 3.4.1, it is not anticipated that the DOE will 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 the geologic repository 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 2009 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 timeline presented in Section 4.

TABLE 3.1
COMANCHE PEAK NUCLEAR POWER PLANT
SPENT FUEL MANAGEMENT

	Fuel Assembly Inventory		DOE
Year	Pool	ISFSI	Acceptance
2009	2078	0	
2010	2171	0	
2011	2257	96	
2012	2058	384	
2013	2151	384	
2014	2333	384	
2015	2038	768	
2016	2131	768	
2017	2313	768	
2018	2018	1152	
2019	2111	1152	
2020	2293	1152	
2021	1998	1536	
2022	2091	1536	
2023	2273	1536	
2024	1978	1920	
2025	2029	1920	42
2026	2043	1920	168
2027	1942	1984	126
2028	1909	1984	126
2029	1944	1984	147
2030	2100	1984	126
2031	1974	1984	126
2032	1916	1984	147
2033	1983	1984	126
2034	1569	2272	126
2035	1134	2560	147
2036	720	2848	126
2037	306	3136	126
2038	0	3316	126
2039		3188	128

TABLE 3.1(continued)
COMANCHE PEAK NUCLEAR POWER PLANT
SPENT FUEL MANAGEMENT

	Fuel Assembly Inventory		DOE
Year	Pool	ISFSI	Acceptance
2040		3060	128
2041		2932	128
2042		2804	128
2043		2644	160
2044		2516	128
2045		2388	128
2046		2260	128
2047		2132	128
2048		1972	160
2049		1844	128
2050		1716	128
2051		1588	128
2052		1460	128
2053		1300	160
2054		1172	128
2055		1044	128
2056		916	128
2057		788	128
2058		660	128
2059		532	128
2060		404	128
2061		276	128
2062		148	128
2063		20	128
2064		0	20
Total	5101		5101

TABLE 3.2
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	40,171	1,963	1,249	27	3,085	46,495
2031	53,519	13,918	2,067	21,734	19,728	110,964
2032	49,121	19,855	1,324	44,367	9,222	123,889
2033	29,244	10,261	1,066	6,770	4,140	51,481
2034	27,411	9,376	1,042	3,292	3,671	44,792
2035	19,351	7,623	667	3,472	4,743	35,856
2036	1,948	2,441	0	4	1,002	5,396
2037	1,943	2,434	0	4	1,000	5,381
2038	1,943	2,434	0	4	1,000	5,381
2039	12,613	1,684	164	14	2,155	16,628
2040	12,531	6,927	162	3	1,775	21,398
2041	11,014	8,035	139	0	1,536	20,724
2042	3,122	1,335	22	0	844	5,322
2043	1,661	95	0	0	715	2,472
2044	1,666	95	0	0	717	2,478
2045	1,661	95	0	0	715	2,472
2046	1,661	95	0	0	715	2,472
2047	1,661	95	0	0	715	2,472
2048	1,666	95	0	0	717	2,478
2049	1,661	95	0	0	715	2,472
2050	1,661	95	0	0	715	2,472
2051	1,661	95	0	0	715	2,472
2052	1,666	95	0	0	717	2,478
2053	1,661	95	0	0	715	2,472
2054	1,661	95	0	0	715	2,472
2055	1,661	95	0	0	715	2,472
2056	1,666	95	0	0	717	2,478
2057	1,661	95	0	0	715	2,472
2058	1,661	95	0	0	715	2,472
2059	1,661	95	0	0	715	2,472
2060	1,666	95	0	0	717	2,478
2061	1,661	95	0	0	715	2,472
2062	1,661	95	0	0	715	2,472

TABLE 3.2 (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,661	95	0	0	715	2,472
2064	1,662	603	0	4	13,180	15,449
2065	819	827	0	460	956	3,061
	301,321	91,709	7,900	80,156	83,070	564,156

TABLE 3.2a
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	39,443	1,503	1,249	27	1,813	44,034
2031	51,875	13,281	2,067	21,734	18,402	107,359
2032	47,589	18,963	1,324	44,367	8,034	120,276
2033	27,041	5,936	1,066	6,770	2,964	43,777
2034	25,146	4,732	1,042	3,292	2,496	36,707
2035	17,640	3,778	667	3,472	3,922	29,478
2036	1,162	82	0	4	704	1,951
2037	1,159	81	0	4	702	1,946
2038	1,159	81	0	4	702	1,946
2039	12,272	661	164	14	1,857	14,967
2040	3,385	175	46	3	1,125	4,734
2041	111	0	0	0	820	930
2042	17	0	0	0	128	145
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	0	0	0	0	0	0
2048	0	0	0	0	0	0
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0

TABLE 3.2a (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	0	0	0	0	0	0
2064	0	509	0	0	12,462	12,972
2065	0	0	0	0	0	0
	227,996	49,782	7,623	79,691	56,131	421,223

TABLE 3.2b
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	153	460	0	0	1,273	1,886
2031	201	604	0	0	1,322	2,127
2032	270	810	0	0	1,178	2,258
2033	1,432	4,296	0	0	1,175	6,903
2034	1,540	4,620	0	0	1,175	7,335
2035	1,277	3,831	0	0	821	5,929
2036	786	2,359	0	0	299	3,444
2037	784	2,353	0	0	298	3,435
2038	784	2,353	0	0	298	3,435
2039	341	1,023	0	0	298	1,661
2040	1,398	95	23	0	649	2,165
2041	1,661	95	28	0	715	2,499
2042	1,661	95	4	0	715	2,476
2043	1,661	95	0	0	715	2,472
2044	1,666	95	0	0	717	2,478
2045	1,661	95	0	0	715	2,472
2046	1,661	95	0	0	715	2,472
2047	1,661	95	0	0	715	2,472
2048	1,666	95	0	0	717	2,478
2049	1,661	95	0	0	715	2,472
2050	1,661	95	0	0	715	2,472
2051	1,661	95	0	0	715	2,472
2052	1,666	95	0	0	717	2,478
2053	1,661	95	0	0	715	2,472
2054	1,661	95	0	0	715	2,472
2055	1,661	95	0	0	715	2,472
2056	1,666	95	0	0	717	2,478
2057	1,661	95	0	0	715	2,472
2058	1,661	95	0	0	715	2,472
2059	1,661	95	0	0	715	2,472
2060	1,666	95	0	0	717	2,478
2061	1,661	95	0	0	715	2,472
2062	1,661	95	0	0	715	2,472

TABLE 3.2b (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,661	95	0	0	715	2,472
2064	1,662	94	0	4	718	2,478
2065	819	827	0	460	956	3,061
	49,681	25,907	55	464	26,923	103,031

TABLE 3.2c
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	575	0	0	0	0	575
2031	1,443	32	0	0	4	1,479
2032	1,262	82	0	0	10	1,355
2033	771	29	0	0	1	801
2034	726	24	0	0	0	750
2035	434	14	0	0	0	448
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	0	0
2039	0	0	0	0	0	0
2040	7,748	6,657	93	0	1	14,499
2041	9,242	7,940	111	0	1	17,295
2042	1,443	1,240	17	0	0	2,701
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	0	0	0	0	0	0
2048	0	0	0	0	0	0
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0

TABLE 3.2c (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
DECON ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
	23,644	16,019	222	0	17	39,902

TABLE 3.3
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	42,059	7,235	1,272	27	2,887	53,480
2034	54,983	19,318	2,066	20,650	12,425	109,442
2035	54,915	24,158	1,320	39,812	7,009	127,214
2036	44,073	9,908	1,058	7,114	3,154	65,307
2037	43,418	9,186	1,042	5,500	2,957	62,104
2038	38,422	8,146	841	6,035	3,609	57,054
2039	26,918	3,616	392	2,803	4,730	38,459
2040	17,985	14,056	162	3	2,090	34,297
2041	16,780	16,475	139	0	1,539	34,933
2042	4,022	2,653	22	0	844	7,541
2043	1,661	95	0	0	715	2,472
2044	1,666	95	0	0	717	2,478
2045	1,661	95	0	0	715	2,472
2046	1,661	95	0	0	715	2,472
2047	1,661	95	0	0	715	2,472
2048	1,666	95	0	0	717	2,478
2049	1,661	95	0	0	715	2,472
2050	1,661	95	0	0	715	2,472
2051	1,661	95	0	0	715	2,472
2052	1,666	95	0	0	717	2,478
2053	1,661	95	0	0	715	2,472
2054	1,661	95	0	0	715	2,472
2055	1,661	95	0	0	715	2,472
2056	1,666	95	0	0	717	2,478
2057	1,661	95	0	0	715	2,472
2058	1,661	95	0	0	715	2,472
2059	1,661	95	0	0	715	2,472
2060	1,666	95	0	0	717	2,478
2061	1,661	95	0	0	715	2,472
2062	1,661	95	0	0	715	2,472
2063	1,661	95	0	0	715	2,472
2064	1,662	603	0	4	13,180	15,449

TABLE 3.3 (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	819	827	0	460	956	3,061
	380,968	118,172	8,313	82,410	70,415	660,279

TABLE 3.3a
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	39,907	1,531	1,272	27	1,591	44,327
2034	52,586	15,197	2,066	20,650	11,104	101,603
2035	52,058	20,161	1,320	39,812	5,825	119,176
2036	41,796	7,032	1,058	7,114	1,976	58,976
2037	41,176	6,373	1,042	5,500	1,783	55,874
2038	37,039	6,322	841	6,035	2,797	53,034
2039	26,831	3,386	392	2,803	4,432	37,845
2040	3,952	228	46	3	1,438	5,668
2041	47	0	0	0	820	867
2042	7	0	0	0	128	135
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	0	0	0	0	0	0
2048	0	0	0	0	0	0
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	509	0	0	12,462	12,972

TABLE 3.3a (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	0	0	0	0	0	0
	295,400	60,739	8,036	81,946	44,356	490,476

TABLE 3.3b
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	1,902	5,705	0	0	1,296	8,902
2034	1,360	4,080	0	0	1,318	6,758
2035	1,299	3,898	0	0	1,175	6,372
2036	938	2,814	0	0	1,178	4,930
2037	918	2,753	0	0	1,175	4,845
2038	596	1,789	0	0	812	3,197
2039	77	230	0	0	298	604
2040	1,398	95	23	0	649	2,165
2041	1,661	95	28	0	715	2,499
2042	1,661	95	4	0	715	2,476
2043	1,661	95	0	0	715	2,472
2044	1,666	95	0	0	717	2,478
2045	1,661	95	0	0	715	2,472
2046	1,661	95	0	0	715	2,472
2047	1,661	95	0	0	715	2,472
2048	1,666	95	0	0	717	2,478
2049	1,661	95	0	0	715	2,472
2050	1,661	95	0	0	715	2,472
2051	1,661	95	0	0	715	2,472
2052	1,666	95	0	0	717	2,478
2053	1,661	95	0	0	715	2,472
2054	1,661	95	0	0	715	2,472
2055	1,661	95	0	0	715	2,472
2056	1,666	95	0	0	717	2,478
2057	1,661	95	0	0	715	2,472
2058	1,661	95	0	0	715	2,472
2059	1,661	95	0	0	715	2,472
2060	1,666	95	0	0	717	2,478
2061	1,661	95	0	0	715	2,472
2062	1,661	95	0	0	715	2,472
2063	1,661	95	0	0	715	2,472
2064	1,662	94	0	4	718	2,478

TABLE 3.3b (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	819	827	0	460	956	3,061
	49,201	24,466	55	464	26,038	100,224

TABLE 3.3c
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	250	0	0	0	0	250
2034	1,038	40	0	0	4	1,082
2035	1,557	99	0	0	10	1,666
2036	1,339	62	0	0	0	1,402
2037	1,325	60	0	0	0	1,385
2038	787	35	0	0	0	823
2039	11	0	0	0	0	11
2040	12,635	13,733	93	0	3	26,464
2041	15,072	16,380	111	0	4	31,567
2042	2,354	2,558	17	0	1	4,930
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	0	0	0	0	0	0
2048	0	0	0	0	0	0
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0

TABLE 3.3c (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
DECON ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2065	0	0	0	0	0	0
	36,368	32,968	222	0	22	69,579

TABLE 3.4
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	31,012	1,523	1,249	27	3,085	36,895
2031	21,638	6,092	954	1,051	15,468	45,202
2032	2,088	3,457	279	16	4,215	10,054
2033	2,083	3,447	278	16	4,204	10,027
2034	2,083	3,447	278	16	4,204	10,027
2035	2,330	2,314	222	16	2,902	7,784
2036	2,704	636	139	16	975	4,470
2037	2,696	634	139	16	972	4,457
2038	2,696	634	139	16	972	4,457
2039	2,696	634	139	16	972	4,457
2040	2,704	636	139	16	975	4,470
2041	2,696	634	139	16	972	4,457
2042	2,696	634	139	16	972	4,457
2043	2,696	634	139	16	972	4,457
2044	2,704	636	139	16	975	4,470
2045	2,696	634	139	16	972	4,457
2046	2,696	634	139	16	972	4,457
2047	2,696	634	139	16	972	4,457
2048	2,704	636	139	16	975	4,470
2049	2,696	634	139	16	972	4,457
2050	2,696	634	139	16	972	4,457
2051	2,696	634	139	16	972	4,457
2052	2,704	636	139	16	975	4,470
2053	2,696	634	139	16	972	4,457
2054	2,696	634	139	16	972	4,457
2055	2,696	634	139	16	972	4,457
2056	2,704	636	139	16	975	4,470
2057	2,696	634	139	16	972	4,457
2058	2,696	634	139	16	972	4,457
2059	2,696	634	139	16	972	4,457
2060	2,704	636	139	16	975	4,470
2061	2,696	634	139	16	972	4,457
2062	2,696	634	139	16	972	4,457

TABLE 3.4 (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	2,696	634	139	16	972	4,457
2064	2,701	635	139	16	974	4,464
2065	1,582	239	139	15	636	2,612
2066	1,582	239	139	15	636	2,612
2067	1,582	239	139	15	636	2,612
2068	1,587	239	139	16	638	2,619
2069	1,582	239	139	15	636	2,612
2070	1,582	239	139	15	636	2,612
2071	1,582	239	139	15	636	2,612
2072	1,587	239	139	16	638	2,619
2073	1,582	239	139	15	636	2,612
2074	1,582	239	139	15	636	2,612
2075	1,582	239	139	15	636	2,612
2076	1,587	239	139	16	638	2,619
2077	1,582	239	139	15	636	2,612
2078	1,582	239	139	15	636	2,612
2079	1,582	239	139	15	636	2,612
2080	1,587	239	139	16	638	2,619
2081	1,582	239	139	15	636	2,612
2082	22,606	1,072	910	21	685	25,295
2083	43,272	5,758	1,382	4,546	5,174	60,132
2084	46,730	19,769	1,324	41,377	17,190	126,390
2085	24,542	6,113	1,067	6,844	3,611	42,177
2086	22,349	4,760	1,042	3,423	2,266	33,841
2087	13,845	2,902	628	2,065	1,481	20,920
2088	944	82	0	4	290	1,320
2089	12,728	724	183	15	698	14,347
2090	10,773	7,414	153	2	195	18,537
2091	9,860	8,131	139	0	114	18,244
2092	945	780	13	0	11	1,749
	374,991	100,252	16,497	60,157	104,828	656,727

TABLE 3.4a
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	30,858	1,063	1,249	27	1,813	35,009
2031	21,079	4,548	900	1,051	13,217	40,794
2032	902	241	139	16	661	1,959
2033	900	240	139	16	659	1,953
2034	900	240	139	16	659	1,953
2035	1,175	241	139	16	659	2,229
2036	1,587	243	139	16	661	2,646
2037	1,582	242	139	16	659	2,638
2038	1,582	242	139	16	659	2,638
2039	1,582	242	139	16	659	2,638
2040	1,587	243	139	16	661	2,646
2041	1,582	242	139	16	659	2,638
2042	1,582	242	139	16	659	2,638
2043	1,582	242	139	16	659	2,638
2044	1,587	243	139	16	661	2,646
2045	1,582	242	139	16	659	2,638
2046	1,582	242	139	16	659	2,638
2047	1,582	242	139	16	659	2,638
2048	1,587	243	139	16	661	2,646
2049	1,582	242	139	16	659	2,638
2050	1,582	242	139	16	659	2,638
2051	1,582	242	139	16	659	2,638
2052	1,587	243	139	16	661	2,646
2053	1,582	242	139	16	659	2,638
2054	1,582	242	139	16	659	2,638
2055	1,582	242	139	16	659	2,638
2056	1,587	243	139	16	661	2,646
2057	1,582	242	139	16	659	2,638
2058	1,582	242	139	16	659	2,638
2059	1,582	242	139	16	659	2,638
2060	1,587	243	139	16	661	2,646
2061	1,582	242	139	16	659	2,638
2062	1,582	242	139	16	659	2,638

TABLE 3.4a (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,582	242	139	16	659	2,638
2064	1,587	243	139	16	661	2,646
2065	1,582	239	139	15	636	2,612
2066	1,582	239	139	15	636	2,612
2067	1,582	239	139	15	636	2,612
2068	1,587	239	139	16	638	2,619
2069	1,582	239	139	15	636	2,612
2070	1,582	239	139	15	636	2,612
2071	1,582	239	139	15	636	2,612
2072	1,587	239	139	16	638	2,619
2073	1,582	239	139	15	636	2,612
2074	1,582	239	139	15	636	2,612
2075	1,582	239	139	15	636	2,612
2076	1,587	239	139	16	638	2,619
2077	1,582	239	139	15	636	2,612
2078	1,582	239	139	15	636	2,612
2079	1,582	239	139	15	636	2,612
2080	1,587	239	139	16	638	2,619
2081	1,582	239	139	15	636	2,612
2082	22,191	1,072	910	21	685	24,879
2083	41,959	5,748	1,382	4,546	5,173	58,807
2084	45,178	19,672	1,324	41,377	17,180	124,730
2085	23,736	6,077	1,067	6,676	3,317	40,874
2086	21,617	4,731	1,042	3,238	1,943	32,572
2087	13,403	2,884	628	1,954	1,286	20,156
2088	944	82	0	4	290	1,320
2089	12,728	724	183	15	698	14,347
2090	2,012	107	28	2	92	2,242
2091	111	0	0	0	0	111
2092	11	0	0	0	0	11
	312,536	58,768	15,665	59,693	78,286	524,948

TABLE 3.4b
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	153	460	0	0	1,273	1,886
2031	559	1,544	54	0	2,250	4,408
2032	1,186	3,216	139	0	3,554	8,096
2033	1,183	3,207	139	0	3,545	8,074
2034	1,183	3,207	139	0	3,545	8,074
2035	1,155	2,073	83	0	2,243	5,555
2036	1,117	393	0	0	314	1,824
2037	1,114	392	0	0	313	1,819
2038	1,114	392	0	0	313	1,819
2039	1,114	392	0	0	313	1,819
2040	1,117	393	0	0	314	1,824
2041	1,114	392	0	0	313	1,819
2042	1,114	392	0	0	313	1,819
2043	1,114	392	0	0	313	1,819
2044	1,117	393	0	0	314	1,824
2045	1,114	392	0	0	313	1,819
2046	1,114	392	0	0	313	1,819
2047	1,114	392	0	0	313	1,819
2048	1,117	393	0	0	314	1,824
2049	1,114	392	0	0	313	1,819
2050	1,114	392	0	0	313	1,819
2051	1,114	392	0	0	313	1,819
2052	1,117	393	0	0	314	1,824
2053	1,114	392	0	0	313	1,819
2054	1,114	392	0	0	313	1,819
2055	1,114	392	0	0	313	1,819
2056	1,117	393	0	0	314	1,824
2057	1,114	392	0	0	313	1,819
2058	1,114	392	0	0	313	1,819
2059	1,114	392	0	0	313	1,819
2060	1,117	393	0	0	314	1,824
2061	1,114	392	0	0	313	1,819
2062	1,114	392	0	0	313	1,819

TABLE 3.4b (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	1,114	392	0	0	313	1,819
2064	1,114	392	0	0	313	1,819
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	0	0	0	0	0	0
2080	0	0	0	0	0	0
2081	0	0	0	0	0	0
2082	0	0	0	0	0	0
2083	0	0	0	0	0	0
2084	0	0	0	0	0	0
2085	6	5	0	168	293	472
2086	7	5	0	185	322	519
2087	4	3	0	111	194	313
2088	0	0	0	0	0	0
2089	0	0	0	0	0	0
2090	208	167	0	0	13	388
2091	232	185	0	0	14	431
2092	22	18	0	0	1	41
	38,228	25,460	555	464	26,331	91,037

TABLE 3.4c
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2030	0	0	0	0	0	0
2031	0	0	0	0	0	0
2032	0	0	0	0	0	0
2033	0	0	0	0	0	0
2034	0	0	0	0	0	0
2035	0	0	0	0	0	0
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	0	0
2039	0	0	0	0	0	0
2040	0	0	0	0	0	0
2041	0	0	0	0	0	0
2042	0	0	0	0	0	0
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	0	0	0	0	0	0
2048	0	0	0	0	0	0
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0

TABLE 3.4c (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 1
SAFSTOR ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	0	0	0	0	0	0
2080	0	0	0	0	0	0
2081	0	0	0	0	0	0
2082	416	0	0	0	0	416
2083	1,313	11	0	0	1	1,325
2084	1,553	97	0	0	10	1,660
2085	800	31	0	0	1	832
2086	726	24	0	0	0	750
2087	438	14	0	0	0	452
2088	0	0	0	0	0	0
2089	0	0	0	0	0	0
2090	8,553	7,140	125	0	90	15,907
2091	9,517	7,945	139	0	100	17,702
2092	913	762	13	0	10	1,697
	24,228	16,024	277	0	212	40,741

TABLE 3.5
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	35,537	6,787	1,272	27	2,887	46,510
2034	30,502	10,166	936	1,175	11,509	54,289
2035	11,248	3,512	278	18	3,839	18,895
2036	11,279	3,522	279	18	3,849	18,946
2037	11,248	3,512	278	18	3,839	18,895
2038	7,757	2,232	220	17	2,659	12,885
2039	2,810	417	139	16	987	4,369
2040	2,818	418	139	16	990	4,381
2041	2,810	417	139	16	987	4,369
2042	2,810	417	139	16	987	4,369
2043	2,810	417	139	16	987	4,369
2044	2,818	418	139	16	990	4,381
2045	2,810	417	139	16	987	4,369
2046	2,810	417	139	16	987	4,369
2047	2,810	417	139	16	987	4,369
2048	2,818	418	139	16	990	4,381
2049	2,810	417	139	16	987	4,369
2050	2,810	417	139	16	987	4,369
2051	2,810	417	139	16	987	4,369
2052	2,818	418	139	16	990	4,381
2053	2,810	417	139	16	987	4,369
2054	2,810	417	139	16	987	4,369
2055	2,810	417	139	16	987	4,369
2056	2,818	418	139	16	990	4,381
2057	2,810	417	139	16	987	4,369
2058	2,810	417	139	16	987	4,369
2059	2,810	417	139	16	987	4,369
2060	2,818	418	139	16	990	4,381
2061	2,810	417	139	16	987	4,369
2062	2,810	417	139	16	987	4,369
2063	2,810	417	139	16	987	4,369
2064	2,815	418	139	16	989	4,377
2065	1,724	308	139	15	664	2,851

TABLE 3.5 (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	1,724	308	139	15	664	2,851
2067	1,724	308	139	15	664	2,851
2068	1,729	309	139	16	666	2,859
2069	1,724	308	139	15	664	2,851
2070	1,724	308	139	15	664	2,851
2071	1,724	308	139	15	664	2,851
2072	1,729	309	139	16	666	2,859
2073	1,724	308	139	15	664	2,851
2074	1,724	308	139	15	664	2,851
2075	1,724	308	139	15	664	2,851
2076	1,729	309	139	16	666	2,859
2077	1,724	308	139	15	664	2,851
2078	1,724	308	139	15	664	2,851
2079	1,724	308	139	15	664	2,851
2080	1,729	309	139	16	666	2,859
2081	1,724	308	139	15	664	2,851
2082	1,724	308	139	15	664	2,851
2083	10,409	824	653	18	668	12,572
2084	25,781	4,257	1,393	23	703	32,158
2085	45,947	20,879	1,327	33,561	14,028	115,742
2086	38,485	9,240	1,097	11,700	4,698	65,220
2087	36,243	6,056	1,042	5,482	2,070	50,893
2088	36,343	6,073	1,045	5,497	2,076	51,033
2089	27,282	2,980	540	1,890	1,125	33,817
2090	16,335	15,031	153	2	169	31,689
2091	15,626	16,571	139	0	117	32,453
2092	1,498	1,589	13	0	11	3,112
	465,692	129,640	16,783	60,134	91,885	764,134

TABLE 3.5a
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	33,636	1,082	1,272	27	1,591	37,608
2034	25,785	6,383	879	1,175	9,379	43,602
2035	1,724	343	139	18	674	2,898
2036	1,729	344	139	18	676	2,906
2037	1,724	343	139	18	674	2,898
2038	1,724	330	139	17	674	2,884
2039	1,724	312	139	16	674	2,865
2040	1,729	313	139	16	676	2,873
2041	1,724	312	139	16	674	2,865
2042	1,724	312	139	16	674	2,865
2043	1,724	312	139	16	674	2,865
2044	1,729	313	139	16	676	2,873
2045	1,724	312	139	16	674	2,865
2046	1,724	312	139	16	674	2,865
2047	1,724	312	139	16	674	2,865
2048	1,729	313	139	16	676	2,873
2049	1,724	312	139	16	674	2,865
2050	1,724	312	139	16	674	2,865
2051	1,724	312	139	16	674	2,865
2052	1,729	313	139	16	676	2,873
2053	1,724	312	139	16	674	2,865
2054	1,724	312	139	16	674	2,865
2055	1,724	312	139	16	674	2,865
2056	1,729	313	139	16	676	2,873
2057	1,724	312	139	16	674	2,865
2058	1,724	312	139	16	674	2,865
2059	1,724	312	139	16	674	2,865
2060	1,729	313	139	16	676	2,873
2061	1,724	312	139	16	674	2,865
2062	1,724	312	139	16	674	2,865
2063	1,724	312	139	16	674	2,865
2064	1,729	313	139	16	676	2,873
2065	1,724	308	139	15	664	2,851

TABLE 3.5a (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
LICENSE TERMINATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	1,724	308	139	15	664	2,851
2067	1,724	308	139	15	664	2,851
2068	1,729	309	139	16	666	2,859
2069	1,724	308	139	15	664	2,851
2070	1,724	308	139	15	664	2,851
2071	1,724	308	139	15	664	2,851
2072	1,729	309	139	16	666	2,859
2073	1,724	308	139	15	664	2,851
2074	1,724	308	139	15	664	2,851
2075	1,724	308	139	15	664	2,851
2076	1,729	309	139	16	666	2,859
2077	1,724	308	139	15	664	2,851
2078	1,724	308	139	15	664	2,851
2079	1,724	308	139	15	664	2,851
2080	1,729	309	139	16	666	2,859
2081	1,724	308	139	15	664	2,851
2082	1,724	308	139	15	664	2,851
2083	10,290	824	653	18	668	12,453
2084	25,302	4,257	1,393	23	703	31,679
2085	44,017	20,766	1,327	33,561	14,019	113,689
2086	37,212	9,173	1,097	11,582	4,490	63,553
2087	35,162	6,003	1,042	5,334	1,813	49,354
2088	35,258	6,020	1,045	5,349	1,818	49,489
2089	26,912	2,962	540	1,840	1,037	33,290
2090	2,335	140	28	2	64	2,569
2091	47	0	0	0	0	47
2092	5	0	0	0	0	5
	358,787	72,649	15,950	59,670	67,774	574,830

TABLE 3.5b
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	1,902	5,705	0	0	1,296	8,902
2034	4,717	3,783	57	0	2,130	10,687
2035	9,523	3,170	139	0	3,165	15,997
2036	9,550	3,178	139	0	3,173	16,041
2037	9,523	3,170	139	0	3,165	15,997
2038	6,033	1,902	81	0	1,985	10,001
2039	1,086	105	0	0	313	1,504
2040	1,089	105	0	0	314	1,508
2041	1,086	105	0	0	313	1,504
2042	1,086	105	0	0	313	1,504
2043	1,086	105	0	0	313	1,504
2044	1,089	105	0	0	314	1,508
2045	1,086	105	0	0	313	1,504
2046	1,086	105	0	0	313	1,504
2047	1,086	105	0	0	313	1,504
2048	1,089	105	0	0	314	1,508
2049	1,086	105	0	0	313	1,504
2050	1,086	105	0	0	313	1,504
2051	1,086	105	0	0	313	1,504
2052	1,089	105	0	0	314	1,508
2053	1,086	105	0	0	313	1,504
2054	1,086	105	0	0	313	1,504
2055	1,086	105	0	0	313	1,504
2056	1,089	105	0	0	314	1,508
2057	1,086	105	0	0	313	1,504
2058	1,086	105	0	0	313	1,504
2059	1,086	105	0	0	313	1,504
2060	1,089	105	0	0	314	1,508
2061	1,086	105	0	0	313	1,504
2062	1,086	105	0	0	313	1,504
2063	1,086	105	0	0	313	1,504
2064	1,086	105	0	0	313	1,504
2065	0	0	0	0	0	0

TABLE 3.5b (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
SPENT FUEL MANAGEMENT EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	0	0	0	0	0	0
2080	0	0	0	0	0	0
2081	0	0	0	0	0	0
2082	0	0	0	0	0	0
2083	0	0	0	0	0	0
2084	0	0	0	0	0	0
2085	0	0	0	0	0	0
2086	4	3	0	118	207	332
2087	5	4	0	147	257	414
2088	5	4	0	148	258	415
2089	2	1	0	51	88	142
2090	208	167	0	0	13	388
2091	232	185	0	0	14	431
2092	22	18	0	0	1	41
	69,974	24,019	555	464	23,896	118,908

TABLE 3.5c
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2033	0	0	0	0	0	0
2034	0	0	0	0	0	0
2035	0	0	0	0	0	0
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	0	0
2039	0	0	0	0	0	0
2040	0	0	0	0	0	0
2041	0	0	0	0	0	0
2042	0	0	0	0	0	0
2043	0	0	0	0	0	0
2044	0	0	0	0	0	0
2045	0	0	0	0	0	0
2046	0	0	0	0	0	0
2047	0	0	0	0	0	0
2048	0	0	0	0	0	0
2049	0	0	0	0	0	0
2050	0	0	0	0	0	0
2051	0	0	0	0	0	0
2052	0	0	0	0	0	0
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	0	0	0	0	0	0
2056	0	0	0	0	0	0
2057	0	0	0	0	0	0
2058	0	0	0	0	0	0
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0

TABLE 3.5c (continued)
COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2
SAFSTOR ALTERNATIVE
SITE RESTORATION EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	0	0	0	0	0	0
2080	0	0	0	0	0	0
2081	0	0	0	0	0	0
2082	0	0	0	0	0	0
2083	119	0	0	0	0	119
2084	479	0	0	0	0	479
2085	1,930	113	0	0	9	2,053
2086	1,269	64	0	0	2	1,335
2087	1,077	49	0	0	0	1,125
2088	1,079	49	0	0	0	1,128
2089	369	17	0	0	0	385
2090	13,791	14,724	125	0	92	28,733
2091	15,347	16,385	139	0	103	31,974
2092	1,472	1,571	13	0	10	3,066
	36,932	32,972	277	0	216	70,396

4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this study 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 plan described in Section 3.5.1.

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 pools within five and one half 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 2003" computer software.[27]

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 man-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 handling area is isolated until such time that all spent fuel has been discharged from the spent fuel pools to the DOE or to the ISFSI for interim storage. Decontamination and dismantling of the storage pools is initiated once the transfer of spent fuel is complete (DECON alternative).
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- 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 storage area for final decontamination.

Project timelines are provided in Figures 4.2 and 4.3, with milestone dates based on the 2030 and 2033 shutdown dates for Units 1 and 2, respectively. The fuel pools are emptied approximately five and one half years after shutdown, while ISFSI operations continue until the DOE can complete the transfer of assemblies to its geologic repository. Deferred decommissioning in the SAFSTOR alternative 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

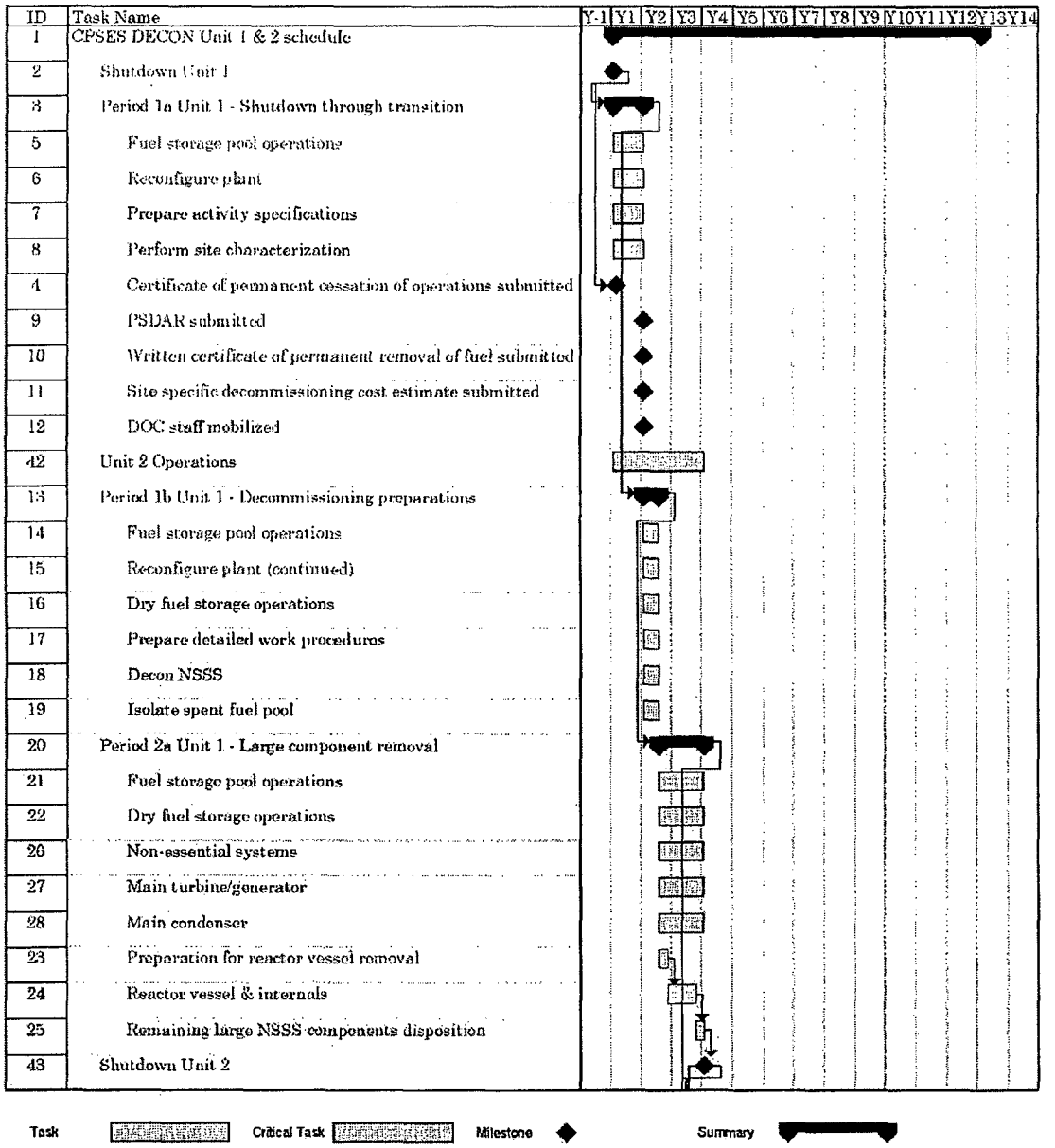


FIGURE 4.1 (continued)
ACTIVITY SCHEDULE

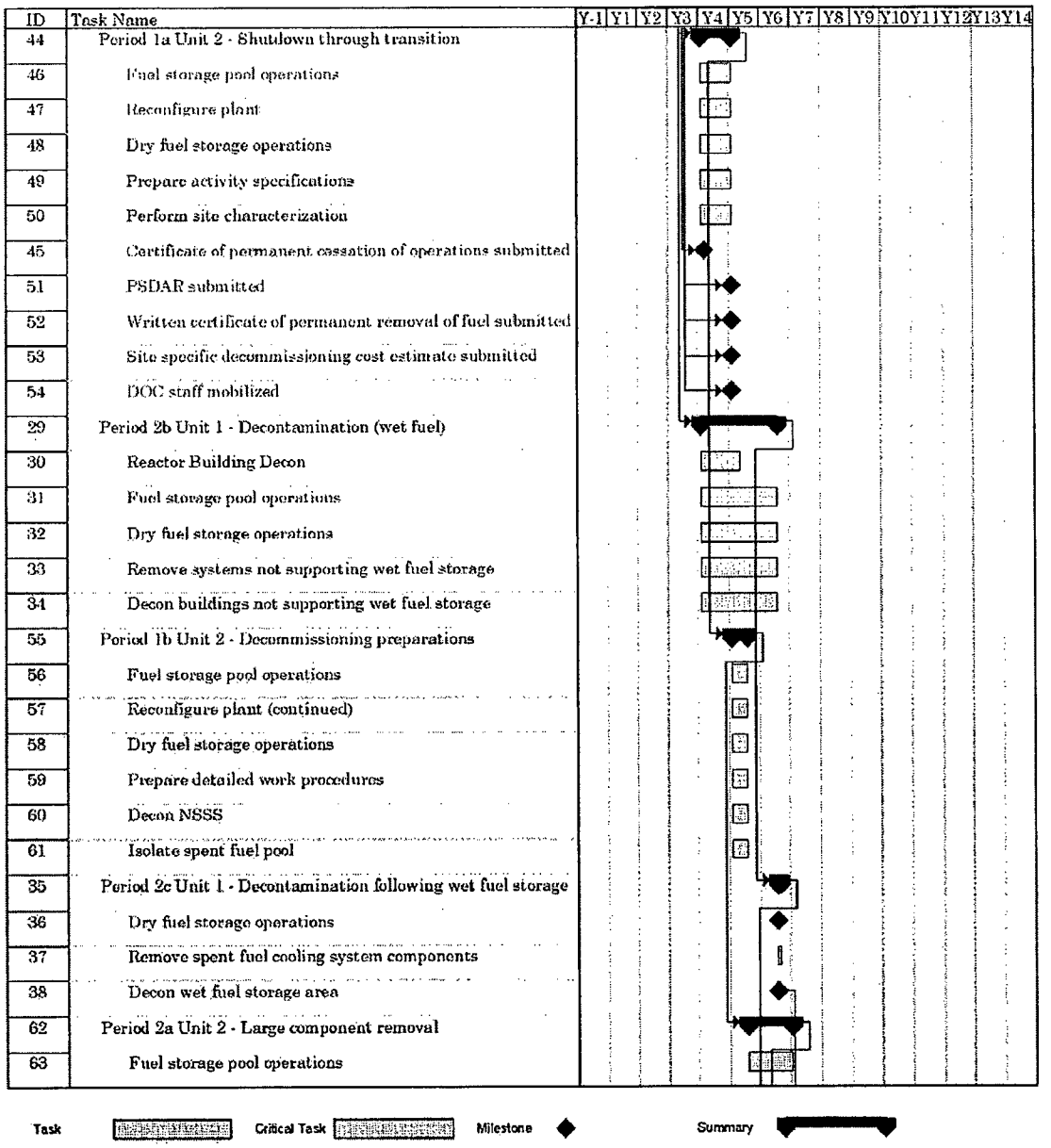


FIGURE 4.1 (continued)
ACTIVITY SCHEDULE

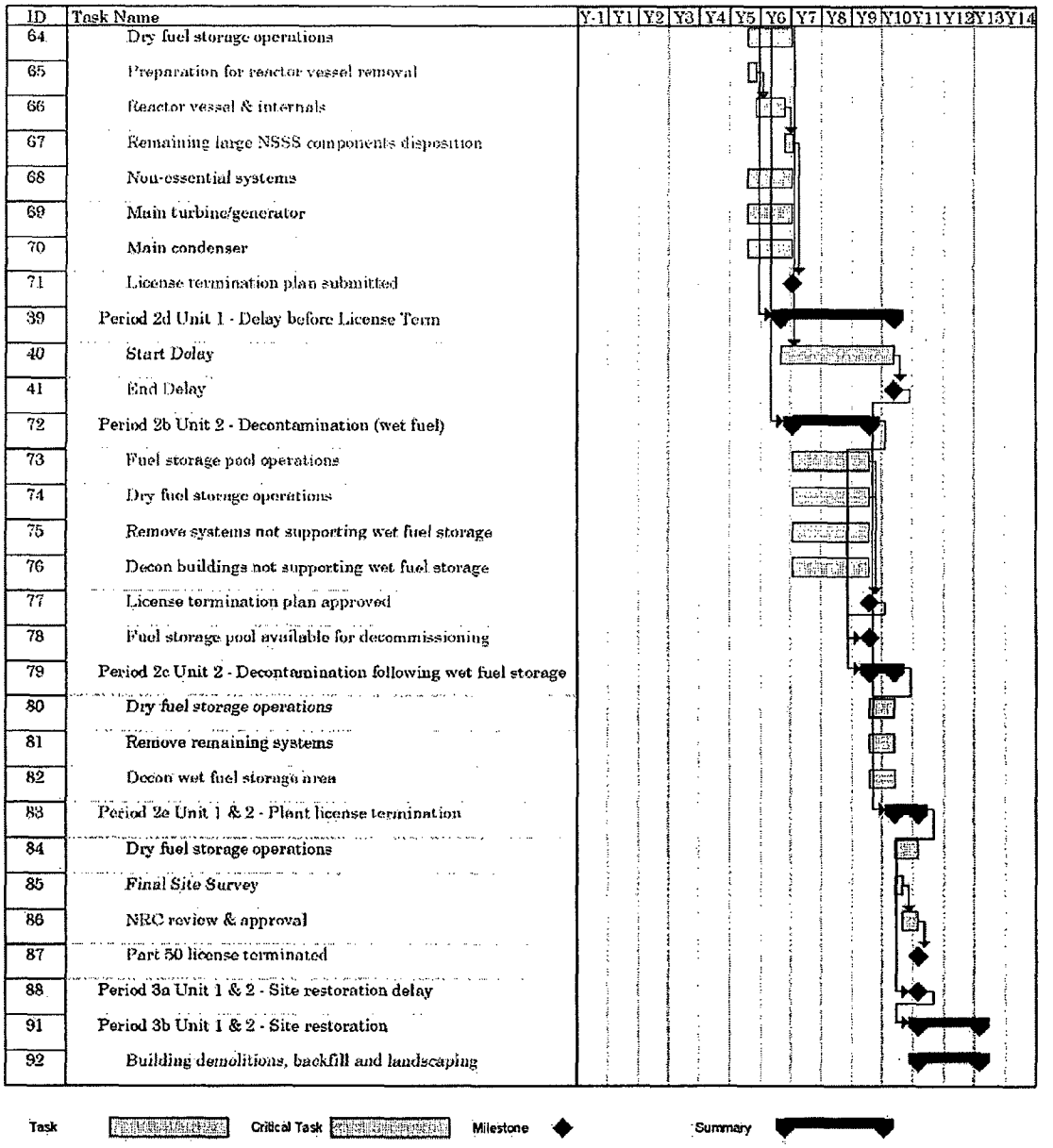


FIGURE 4.2
DECOMMISSIONING TIMELINE
DECON
(not to scale)

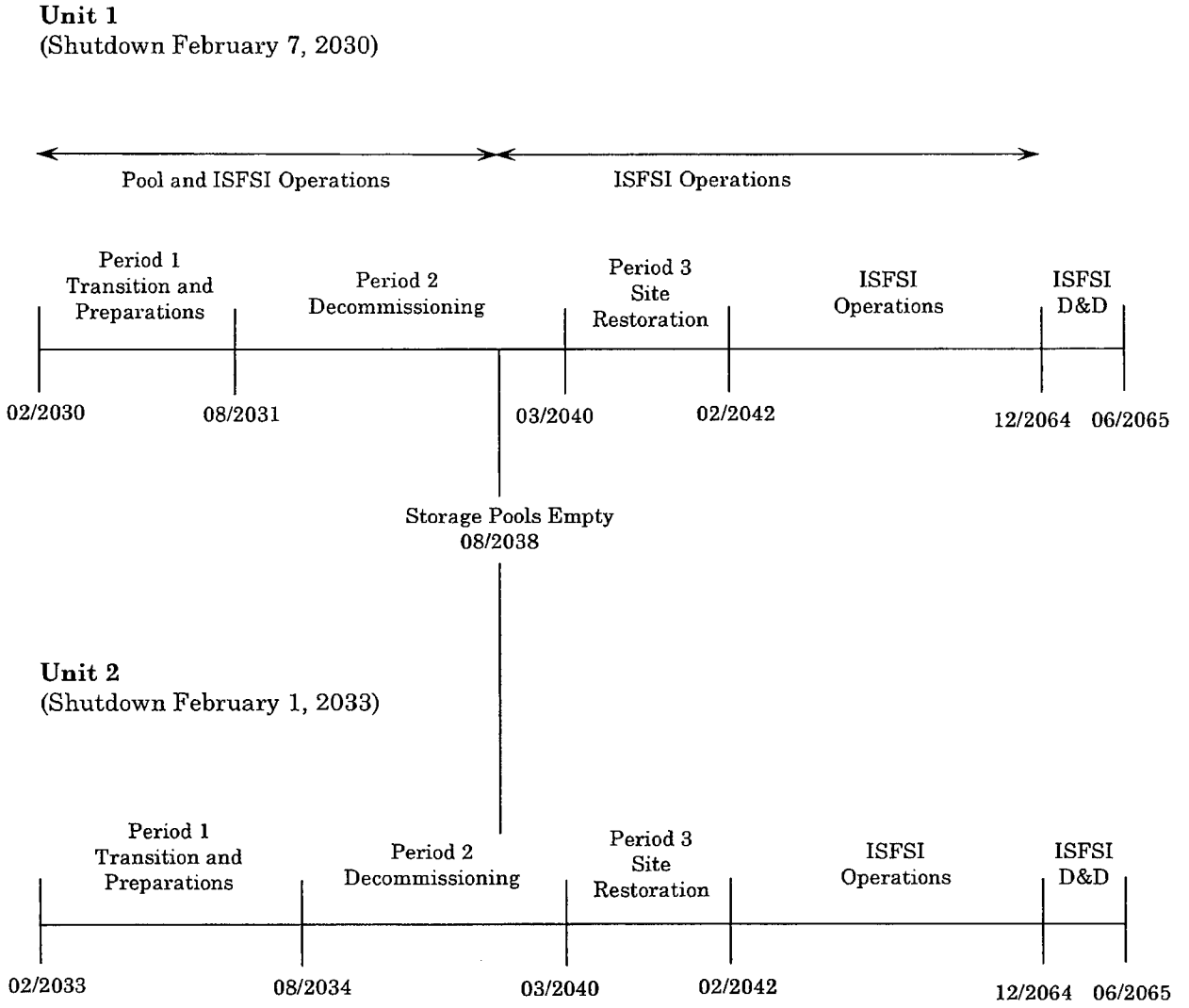
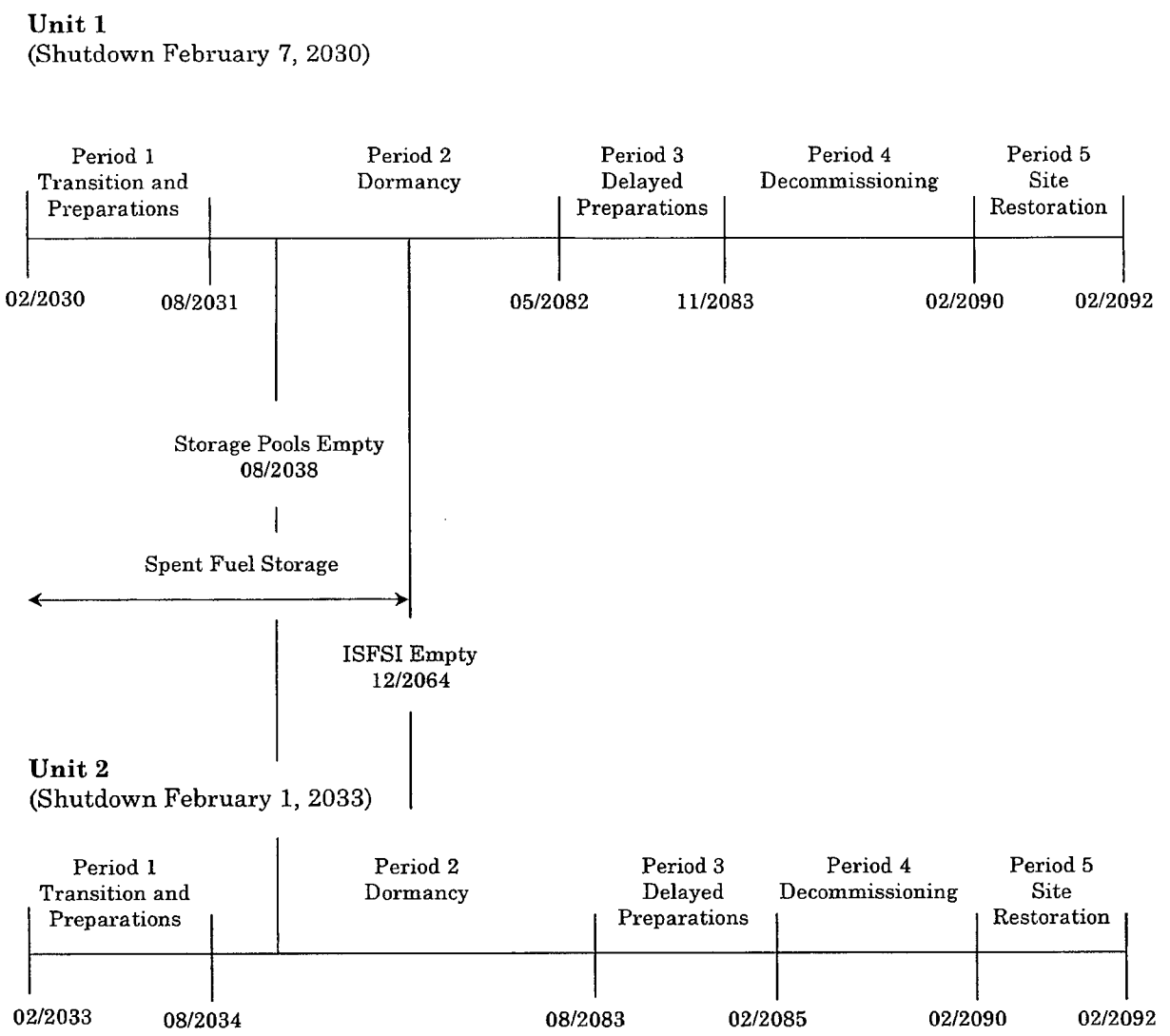


FIGURE 4.3
DECOMMISSIONING TIMELINE
SAFSTOR
(not to scale)



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,[28] 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 volumes of radioactive waste generated during the various decommissioning activities at the site are shown on a line-item basis in Appendices C and D, and summarized in Tables 5.1 and 5.2. The quantified waste volume summaries shown in these tables are consistent with Part 61 classifications. 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 canisters.

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 plants 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.

For purposes of constructing the estimates, the Luminant's current cost for disposal at the EnergySolutions facility was used as a proxy for Waste Control Specialists' yet-to-be constructed Andrews County facility. Separate rates were used for containerized waste and large components. 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 EnergySolutions 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 the last published rate schedule for non-compact waste for the Barnwell facility (as a proxy). Additional surcharges were included for activity, dose rate, and/or handling added as appropriate for a particular package.

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)	EnergySolutions	A	244,213	20,377,455
	Barnwell	B	7,971	993,361
	Barnwell	C	918	96,896
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,010	208,292
Total [2]			254,113	21,676,004
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	396,629	15,295,339

[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)	EnergySolutions	A	212,903	16,010,852
	Barnwell	B	6,660	704,866
	Barnwell	C	939	95,516
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,010	208,292
Total [2]			221,513	17,019,526
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	477,172	18,650,521

[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 Comanche Peak relied upon the site-specific, technical information developed for a previous analysis prepared in 2005, updated to reflect current assumptions pertaining to the disposition of the nuclear station and relevant industry experience in undertaking such projects. While not an engineering study, the estimates provide Luminant 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 station's spent fuel pools for a minimum of five and one half years following the cessation of operations for continued cooling of the assemblies.

The cost projected to promptly decommission the station, manage the spent fuel, and restore the site, is estimated to be $1,224.4 million. The majority of this cost (approximately 74.5%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 16.6% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 8.9% 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 $1,420.9 million. The majority of this cost (approximately 77.4%) 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 14.8% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 7.8% 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 is the largest single contributor 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 Luminant will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The owner will

provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating licenses are 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). Finally, both the estimates for DECON and SAFSTOR include the costs of disposing of the retired steam generators and the reactor vessel closure head from Unit 1. The study assumes that the disposal of the components would occur after shutdown, however, the costs are identified separately because the disposal activities could be conducted at anytime.

As described in this report, the spent fuel pools will remain operational for a minimum of five and one half years following the cessation of operations. The pools will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool area. Over the five and one half-year period, the spent fuel will be packaged into transportable canisters for loading into a DOE-provided transport cask or relocation to the 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 majority of the low-level radioactive material requiring controlled disposal will be at Waste Control Specialists' Andrews County facility. 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 wages. Non-radiological demolition is a natural extension of

the decommissioning process. 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 plant.

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 2009 dollars)

Cost Element	Total	Percentage
Decontamination	24,945	2.0
Removal	197,066	16.1
Packaging	30,897	2.5
Transportation	12,952	1.1
Waste Disposal	145,737	11.9
Off-site Waste Processing	41,754	3.4
Program Management [1]	545,029	44.5
Spent Fuel Pool Isolation	18,572	1.5
Spent Fuel Management (Direct Costs) [2]	103,765	8.5
Insurance and Regulatory Fees	27,477	2.2
Energy	16,214	1.3
Characterization and Licensing Surveys	21,432	1.8
Property Taxes	6,718	0.5
Miscellaneous Equipment	13,012	1.1
Decommissioning Staff Severance	18,868	1.5
Total [3]	1,224,435	100.0

Cost Element	Total	Percentage
License Termination (excluding retired large components)	890,160	72.7
Large Components (retired) [4]	21,540	1.8
Spent Fuel Management	203,255	16.6
Site Restoration	109,481	8.9
Total [3]	1,224,435	100.0

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees
[3] Column may not add due to rounding
[4] Includes retired steam generators and reactor closure head from Unit 1 and turbine rotors from Unit 2

TABLE 6.2
SAFSTOR ALTERNATIVE
DECOMMISSIONING COST ELEMENTS
(thousands of 2009 dollars)

Cost Element	Total	Percentage
Decontamination	24,474	1.7
Removal	199,699	14.1
Packaging	21,532	1.5
Transportation	10,976	0.8
Waste Disposal	94,396	6.6
Off-site Waste Processing	50,821	3.6
Program Management [1]	698,454	49.2
Spent Fuel Pool Isolation	18,572	1.3
Spent Fuel Management (Direct Costs) [2]	96,899	6.8
Insurance and Regulatory Fees	72,192	5.1
Energy	33,280	2.3
Characterization and Licensing Surveys	24,190	1.7
Property Taxes	11,991	0.8
Miscellaneous Equipment	46,493	3.3
Decommissioning Staff Severance	16,891	1.2
Total [3]	1,420,860	100.0

Cost Element	Total	Percentage
License Termination (excluding retired large components)	1,078,294	75.9
Large Components (retired) [4]	21,484	1.5
Spent Fuel Management	209,945	14.8
Site Restoration	111,137	7.8
Total [3]	1,420,860	100.0

[1] Includes engineering costs
[2] Excludes program management costs (staffing) but includes costs for spent fuel loading/transfer costs/spent fuel pool O&M and EP fees
[3] Column may not add due to rounding
[4] Includes retired steam generators and reactor closure head from Unit 1 and turbine rotors from Unit 2

7. REFERENCES

1. "Decommissioning Cost Analysis for the Comanche Peak Steam Electric Station," Document T04-1471-002, Rev. 1, TLG Services, Inc., May 2005

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, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," October 2003

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

5. U.S. Code of Federal Regulations, Title 10, Parts 20 and 50, "Entombment Options for Power Reactors," Advanced Notice of Proposed Rulemaking, Federal Register Volume 66, Number 200, October 16, 2001

6. 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.

7. "Nuclear Waste Policy Act of 1982 and Amendments," U.S. Department of Energy's Office of Civilian Radioactive Management, 1982

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

9. "Low Level Radioactive Waste Policy Act," Public Law 96-573, 1980

10. "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1986

11. Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

12. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Radiological Criteria for License Termination," Federal Register, Volume 62, Number 139 (p 39058 et seq.), July 21, 1997

7. REFERENCES
(continued)

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

14. U.S. Code of Federal Regulations, Title 40, Part 141.16, "Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems"

15. "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

16. "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG/CR-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, August 2000

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

18. W.J. Manion and T.S. LaGuardia, "Decommissioning Handbook," U.S. Department of Energy, DOE/EV/10128-1, November 1980

19. "Building Construction Cost Data 2009," Robert Snow Means Company, Inc., Kingston, Massachusetts

20. Project and Cost Engineers' Handbook, Second Edition, p. 239, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, 1984

21. U.S. Department of Transportation, Title 49 of the Code of Federal Regulations, "Transportation," Parts 173 through 178

22. Tri-State Motor Transit Company, published tariffs, Interstate Commerce Commission (ICC), Docket No. MC-427719 Rules Tariff, March 2004, Radioactive Materials Tariff, January 2009

23. J.C. Evans et al., "Long-Lived Activation Products in Reactor Materials" NUREG/CR-3474, Pacific Northwest Laboratory for the Nuclear Regulatory Commission: August 1984

7. REFERENCES
(continued)

24. R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission. June 1978

25. H.D. Oak, et al., "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission. June 1980

26. "Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors," 10 CFR Parts 50 and 140, Federal Register Notice, Vol. 62, No. 210, October 30, 1997

27. "Microsoft Project Professional 2003," Microsoft Corporation, Redmond, WA.

28. "Atomic Energy Act of 1954," (68 Stat. 919)

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% 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 hr *****

* alpha designators indicate activities that can be performed in parallel

APPENDIX A
(continued)

3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate ($/hr)	Cost
Laborers	3.00	11.217	$21.36	$718.79
Craftsmen	2.00	11.217	$31.68	$710.71
Foreman	1.00	11.217	$34.00	$381.38
General Foreman	0.25	11.217	$36.13	$101.32
Fire Watch	0.05	11.217	$21.36	$11.98
Health Physics Technician	1.00	11.217	$41.28	$463.04
Total Labor Cost				$2,387.22

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Blotting paper 50 @ $0.65 sq ft [1]	$32.50
-Plastic tarp 50 @ $0.48/sq ft [2]	$24.00
-Gas torch consumables 1 @ $11.31/hr x 1 hr [3]	$11.31
Subtotal cost of equipment and materials	$67.81
Overhead & profit on equipment and materials @ 16.25 %	$11.02
Total costs, equipment & material	$78.83

TOTAL COST:

Removal of contaminated **heat exchanger <3000 pounds:**	**$2,466.05**
Total labor cost:	$2,387.22
Total equipment/material costs:	$78.83
Total craft labor man-hours required per unit:	81.88

** denotes business sensitive information

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 (7428T13)
    2. R.S. Means (2009) Division 01 56, Section 13.60-0200, page 20
    3. R.S. Means (2009) Division 01 54 33, Section 40-6360, page 658

- Material and consumable costs were adjusted using the regional indices for Dallas, Texas.

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	0.25
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	2.59
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	3.77
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	7.53
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	14.31
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	18.67
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	27.46
Removal of clean pipe >36 inches diameter, $/linear foot	32.59
Removal of clean valve >2 to 4 inches	49.89
Removal of clean valve >4 to 8 inches	75.27
Removal of clean valve >8 to 14 inches	143.11
Removal of clean valve >14 to 20 inches	186.72
Removal of clean valve >20 to 36 inches	274.56
Removal of clean valve >36 inches	325.92
Removal of clean pipe hanger for small bore piping	17.66
Removal of clean pipe hanger for large bore piping	60.20
Removal of clean pump, <300 pound	128.37
Removal of clean pump, 300-1000 pound	358.35
Removal of clean pump, 1000-10,000 pound	1,401.73
Removal of clean pump, >10,000 pound	2,715.77
Removal of clean pump motor, 300-1000 pound	148.90
Removal of clean pump motor, 1000-10,000 pound	581.12
Removal of clean pump motor, >10,000 pound	1,307.54
Removal of clean heat exchanger <3000 pound	756.44
Removal of clean heat exchanger >3000 pound	1,910.89
Removal of clean feedwater heater/deaerator	5,360.37
Removal of clean moisture separator/reheater	10,984.97
Removal of clean tank, <300 gallons	164.95
Removal of clean tank, 300-3000 gallon	517.46
Removal of clean tank, >3000 gallons, $/square foot surface area	4.42

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of clean electrical equipment, <300 pound	68.77
Removal of clean electrical equipment, 300-1000 pound	242.43
Removal of clean electrical equipment, 1000-10,000 pound	484.87
Removal of clean electrical equipment, >10,000 pound	1,163.08
Removal of clean electrical transformer < 30 tons	807.74
Removal of clean electrical transformer > 30 tons	2,326.16
Removal of clean standby diesel generator, <100 kW	825.04
Removal of clean standby diesel generator, 100 kW to 1 MW	1,841.54
Removal of clean standby diesel generator, >1 MW	3,812.36
Removal of clean electrical cable tray, $/linear foot	6.52
Removal of clean electrical conduit, $/linear foot	2.85
Removal of clean mechanical equipment, <300 pound	68.77
Removal of clean mechanical equipment, 300-1000 pound	242.43
Removal of clean mechanical equipment, 1000-10,000 pound	484.87
Removal of clean mechanical equipment, >10,000 pound	1,163.08
Removal of clean HVAC equipment, <300 pound	83.17
Removal of clean HVAC equipment, 300-1000 pound	291.30
Removal of clean HVAC equipment, 1000-10,000 pound	580.57
Removal of clean HVAC equipment, >10,000 pound	1,163.08
Removal of clean HVAC ductwork, $/pound	0.26
Removal of contaminated instrument and sampling tubing, $/linear foot	0.91
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	15.63
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	24.11
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	38.23
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	71.78
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	84.77
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	114.41
Removal of contaminated pipe >36 inches diameter, $/linear foot	133.82
Removal of contaminated valve >2 to 4 inches	276.89
Removal of contaminated valve >4 to 8 inches	326.43

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated valve >8 to 14 inches	652.11
Removal of contaminated valve >14 to 20 inches	819.22
Removal of contaminated valve >20 to 36 inches	1,078.41
Removal of contaminated valve >36 inches	1,272.51
Removal of contaminated pipe hanger for small bore piping	91.19
Removal of contaminated pipe hanger for large bore piping	299.22
Removal of contaminated pump, <300 pound	587.31
Removal of contaminated pump, 300-1000 pound	1,332.63
Removal of contaminated pump, 1000-10,000 pound	4,017.31
Removal of contaminated pump, >10,000 pound	9,773.05
Removal of contaminated pump motor, 300-1000 pound	609.79
Removal of contaminated pump motor, 1000-10,000 pound	1,680.39
Removal of contaminated pump motor, >10,000 pound	3,773.08
Removal of contaminated heat exchanger <3000 pound	2,466.05
Removal of contaminated heat exchanger >3000 pound	7,271.21
Removal of contaminated tank, <300 gallons	988.26
Removal of contaminated tank, >300 gallons, $/square foot	17.93
Removal of contaminated electrical equipment, <300 pound	434.73
Removal of contaminated electrical equipment, 300-1000 pound	1,057.73
Removal of contaminated electrical equipment, 1000-10,000 pound	2,039.65
Removal of contaminated electrical equipment, >10,000 pound	4,023.44
Removal of contaminated electrical cable tray, $/linear foot	20.96
Removal of contaminated electrical conduit, $/linear foot	11.65
Removal of contaminated mechanical equipment, <300 pound	482.74
Removal of contaminated mechanical equipment, 300-1000 pound	1,164.82
Removal of contaminated mechanical equipment, 1000-10,000 pound	2,242.31
Removal of contaminated mechanical equipment, >10,000 pound	4,023.44
Removal of contaminated HVAC equipment, <300 pound	482.74
Removal of contaminated HVAC equipment, 300-1000 pound	1,164.82
Removal of contaminated HVAC equipment, 1000-10,000 pound	2,242.31

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Removal of contaminated HVAC equipment, >10,000 pound	4,023.44
Removal of contaminated HVAC ductwork, $/pound	1.50
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	2.26
Additional decontamination of surface by washing, $/square foot	5.04
Additional decontamination of surfaces by hydrolasing, $/square foot	20.56
Decontamination rig hook up and flush, $/ 250 foot length	4,003.80
Chemical flush of components/systems, $/gallon	18.83
Removal of clean standard reinforced concrete, $/cubic yard	99.17
Removal of grade slab concrete, $/cubic yard	125.48
Removal of clean concrete floors, $/cubic yard	278.38
Removal of sections of clean concrete floors, $/cubic yard	779.93
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	192.63
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	1,473.98
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	243.47
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	1,944.71
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	343.57
Removal of below-grade suspended floors, $/cubic yard	278.38
Removal of clean monolithic concrete structures, $/cubic yard	621.93
Removal of contaminated monolithic concrete structures, $/cubic yard	1,456.81
Removal of clean foundation concrete, $/cubic yard	492.12
Removal of contaminated foundation concrete, $/cubic yard	1,358.02
Explosive demolition of bulk concrete, $/cubic yard	22.57
Removal of clean hollow masonry block wall, $/cubic yard	69.52
Removal of contaminated hollow masonry block wall, $/cubic yard	241.23
Removal of clean solid masonry block wall, $/cubic yard	69.52
Removal of contaminated solid masonry block wall, $/cubic yard	241.23
Backfill of below-grade voids, $/cubic yard	24.72
Removal of subterranean tunnels/voids, $/linear foot	78.60
Placement of concrete for below-grade voids, $/cubic yard	147.79
Excavation of clean material, $/cubic yard	2.77

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit($)
Excavation of contaminated material, $/cubic yard	32.47
Removal of clean concrete rubble (tipping fee included), $/cubic yard	22.05
Removal of contaminated concrete rubble, $/cubic yard	20.58
Removal of building by volume, $/cubic foot	0.25
Removal of clean building metal siding, $/square foot	0.71
Removal of contaminated building metal siding, $/square foot	2.73
Removal of standard asphalt roofing, $/square foot	1.15
Removal of transite panels, $/square foot	1.47
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	10.02
Scabbling contaminated concrete floors, $/square foot	5.51
Scabbling contaminated concrete walls, $/square foot	13.82
Scabbling contaminated ceilings, $/square foot	46.72
Scabbling structural steel, $/square foot	4.47
Removal of clean overhead crane/monorail < 10 ton capacity	345.27
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,076.87
Removal of clean overhead crane/monorail >10-50 ton capacity	828.65
Removal of contaminated overhead crane/monorail >10-50 ton capacity	2,584.04
Removal of polar crane > 50 ton capacity	3,487.65
Removal of gantry crane > 50 ton capacity	14,538.47
Removal of structural steel, $/pound	0.15
Removal of clean steel floor grating, $/square foot	2.63
Removal of contaminated steel floor grating, $/square foot	8.14
Removal of clean free standing steel liner, $/square foot	6.62
Removal of contaminated free standing steel liner, $/square foot	20.77
Removal of clean concrete-anchored steel liner, $/square foot	3.31
Removal of contaminated concrete-anchored steel liner, $/square foot	24.20
Placement of scaffolding in clean areas, $/square foot	16.97
Placement of scaffolding in contaminated areas, $/square foot	23.14
Landscaping with topsoil, $/acre	21,306.65
Cost of CPC B-88 LSA box & preparation for use	2,407.05

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	1,970.13
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,766.89
Cost of CPC B-144 LSA box & preparation for use	10,860.78
Cost of LSA drum & preparation for use	167.84
Cost of cask liner for CNSI 8 120A cask (resins)	8,307.75
Cost of cask liner for CNSI 8 120A cask (filters)	8,897.11
Decontamination of surfaces with vacuuming, $/square foot	0.53

APPENDIX C

DETAILED COST ANALYSIS

DECON

Tables

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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	Prepare preliminary decommissioning cost	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	246	37	283	283	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	923	138	1,061	1,061	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	381	57	439	439	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	615	92	708	708	-	-	-	-	-	-	-	-	-	5,000
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	504	76	580	580	-	-	-	-	-	-	-	-	-	4,096
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	605	91	696	627	-	70	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	513	77	590	531	-	59	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	874	131	1,005	1,005	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	800	120	920	920	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	384	58	442	442	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	197	30	226	113	-	113	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	49	7	57	-	-	57	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	49	7	57	-	-	57	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	384	58	442	221	-	221	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	111	17	127	64	-	64	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,655	698	5,353	4,714	-	639	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	295	44	340	340	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	172	26	198	198	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	151	23	174	174	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,076	2,111	16,187	15,548	-	639	-	-	-	-	-	-	-	73,753
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	593	89	682	-	682	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	593	89	682	-	682	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,005	101	1,106	1,106	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	90	9	99	99	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	404	-	-	-	-	-	101	505	505	-	-	-	-	-	-	-	-	-	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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 Period-Dependent Costs (continued)																					
1a.4.4	Heavy equipment rental	-	514	-	-	-	-	-	77	591	591	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	0	-	24	-	6	32	32	-	-	-	493	-	-	-	9,854	2	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,208	181	1,390	1,390	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	738	74	812	812	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	445	44	489	-	489	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	762	114	877	-	877	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	12,264
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	24,777	3,717	28,493	28,493	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	918	2	0	-	24	29,440	4,486	34,870	33,453	1,416	-	-	493	-	-	-	9,854	2	435,664
1a.0	TOTAL PERIOD 1a COST	-	918	2	0	-	24	44,109	6,687	51,739	49,001	2,099	639	-	493	-	-	-	9,854	2	509,417
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	582	87	670	603	-	67	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor Internals	-	-	-	-	-	-	308	46	354	354	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	166	25	191	48	-	143	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	447	67	514	514	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	148	22	170	85	-	85	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	55	8	64	64	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	123	18	142	71	-	71	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	192	29	221	-	-	221	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	192	29	221	-	-	221	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	336	50	386	348	-	39	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	336	50	386	348	-	39	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	4,091	614	4,705	3,820	-	885	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	696	-	-	-	-	-	-	348	1,044	1,044	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	696	-	-	-	-	-	4,091	962	5,749	4,864	-	885	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	4,324	1,297	5,621	5,621	-	-	-	-	-	-	-	-	27,670	10,132
1b.2.2	Spent fuel pool isolation	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	14,014	2,751	16,764	16,764	-	-	-	-	-	-	-	-	27,670	10,132
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	991	-	-	-	-	-	-	149	1,140	1,140	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process liquid waste	56	-	83	233	-	3,502	-	947	4,822	4,822	-	-	-	372	829	-	-	114,407	234	-
1b.3.4	Small tool allowance	-	2	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1b.3.5	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-

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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 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 1b Collateral Costs (continued)																					
1b.3.6	Decon rig	1,400	-	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
1b.3.7	Spent Fuel Capital and Transfer	-	-	-	-	-	-	273	41	314	-	314	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,448	1,102	83	233	-	3,502	1,759	1,735	10,862	10,548	314	-	-	372	829	-	-	114,407	234	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	31	-	-	-	-	-	-	8	38	38	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	509	51	560	560	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	46	5	50	50	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	237	-	-	-	-	-	59	296	296	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	261	-	-	-	-	-	39	300	300	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of OAW generated	-	-	1	0	-	15	-	4	20	20	-	-	-	303	-	-	-	6,050	1	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,225	184	1,409	1,409	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	374	37	412	412	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	225	23	248	-	248	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	386	58	444	-	444	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	22	3	26	-	26	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	6,216
1b.4.13	DOC Staff Cost	-	-	-	-	-	-	4,687	703	5,390	5,390	-	-	-	-	-	-	-	-	-	64,486
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	12,636	1,895	14,531	14,531	-	-	-	-	-	-	-	-	-	215,657
1b.4	Subtotal Period 1b Period-Dependent Costs	31	497	1	0	-	15	20,299	3,097	23,939	23,222	718	-	-	303	-	-	-	6,050	1	286,359
1b.0	TOTAL PERIOD 1b COST	3,175	1,599	84	234	-	3,517	40,162	8,544	57,315	55,398	1,032	885	-	675	829	-	-	120,457	28,972	329,734
PERIOD 1 TOTALS		3,175	2,517	86	234	-	3,540	84,272	15,231	109,054	104,400	3,131	1,524	-	1,168	829	-	-	130,311	28,975	839,151
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	71	84	16	6	-	228	-	116	521	521	-	-	-	722	-	-	-	87,332	4,301	-
2a.1.1.2	Pressurizer Relief Tank	18	16	7	3	-	95	-	38	178	178	-	-	-	329	-	-	-	36,553	1,072	-
2a.1.1.3	Reactor Coolant Pumps & Motors	69	59	154	115	-	2,030	-	589	3,017	3,017	-	-	-	7,231	-	-	-	792,800	4,595	100
2a.1.1.4	Pressurizer	25	32	382	74	-	967	-	312	1,792	1,792	-	-	-	3,445	-	-	-	251,471	2,415	938
2a.1.1.5	Steam Generators	227	3,087	1,964	1,264	2,946	6,568	-	3,355	19,411	19,411	-	-	40,067	23,397	-	-	-	3,329,768	23,233	2,125
2a.1.1.6	*Retired Steam Generator Units*	-	1,455	1,312	1,527	2,946	6,379	891	2,894	17,403	17,403	-	-	40,067	22,721	-	-	-	3,144,067	22,467	14,833
2a.1.1.7	CRDMs/iCIs/Service Structure Removal	92	68	263	19	-	312	-	170	925	925	-	-	-	4,852	-	-	-	119,556	4,524	-
2a.1.1.8	Reactor Vessel Internals	72	2,241	5,079	510	-	8,047	242	7,174	23,364	23,364	-	-	-	1,377	903	459	-	326,029	26,933	1,209
2a.1.1.9	Reactor Vessel	54	4,210	1,544	319	-	8,582	242	7,978	22,930	22,930	-	-	-	6,606	2,254	-	-	978,589	26,933	1,209
2a.1.1	Totals	629	11,252	10,721	3,838	5,891	33,209	1,375	22,627	89,540	89,540	-	-	80,134	70,680	3,156	459	-	9,066,165	116,475	20,415
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	251	335	74	754	466	-	337	2,217	2,217	-	-	3,775	2,102	-	-	-	509,467	8,266	-
2a.1.3	Main Condensers	-	771	194	56	714	466	-	444	2,645	2,645	-	-	6,756	1,992	-	-	-	482,702	25,500	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	1,002	-	-	-	-	-	150	1,152	1,152	-	-	-	-	-	-	-	-	13,996	-
2a.1.4.2	Safeguard	-	108	-	-	-	-	-	16	124	124	-	-	-	-	-	-	-	-	1,588	-
2a.1.4	Totals	-	1,109	-	-	-	-	-	166	1,276	1,276	-	-	-	-	-	-	-	-	15,584	-

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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 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																					
2a.1.5.1	Auxiliary Feedwater (Insulated)	-	504	43	48	696	220	-	297	1,808	1,808	-	-	7,296	986	-	-	-	380,578	13,598	-
2a.1.5.2	Auxiliary Steam	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	395	-
2a.1.5.3	Boron Recycle (insulated)	0	5	0	0	1	2	-	2	11	11	-	-	10	10	-	-	-	1,275	131	-
2a.1.5.4	Boron Recycle (uninsulated)	15	28	2	1	7	13	-	19	85	85	-	-	74	56	-	-	-	8,044	1,165	-
2a.1.5.5	Boron Thermal Regeneration (insulated)	35	73	5	2	17	38	-	49	218	218	-	-	175	164	-	-	-	21,764	2,845	-
2a.1.5.6	Boron Thermal Regeneration (uninsulated)	92	183	15	6	53	109	-	129	587	587	-	-	553	468	-	-	-	64,160	7,194	-
2a.1.5.7	Chemical & Volume Control (insulated)	75	159	11	4	34	77	-	103	461	461	-	-	351	329	-	-	-	43,716	6,290	-
2a.1.5.8	Chemical & Volume Control (uninsulated)	155	321	25	11	97	186	-	223	1,020	1,020	-	-	1,018	804	-	-	-	112,745	12,686	-
2a.1.5.9	Chemical Feed	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	218	-
2a.1.5.10	Chemical Feed - RCA	-	7	0	0	-	2	-	3	13	13	-	-	-	10	-	-	-	935	253	-
2a.1.5.11	Chilled Water - Safety	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	139	-
2a.1.5.12	Chilled Water - Safety - RCA	-	79	5	3	28	35	-	34	184	184	-	-	294	150	-	-	-	25,368	1,982	-
2a.1.5.13	Circulating Water	-	150	-	-	-	-	-	22	172	-	-	172	-	-	-	-	-	-	5,720	-
2a.1.5.14	Component Cooling Water	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	709	-
2a.1.5.15	Component Cooling Water - RCA	-	834	113	119	1,623	771	-	674	4,133	4,133	-	-	17,003	3,294	-	-	-	985,976	22,599	-
2a.1.5.16	Condensate (insulated)	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	4,155	-
2a.1.5.17	Condensate (uninsulated)	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	3,200	-
2a.1.5.18	Condensate Polishing	-	81	-	-	-	-	-	12	93	-	-	93	-	-	-	-	-	-	3,095	-
2a.1.5.19	Condenser Vacuum & Water Box Priming	-	54	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	2,054	-
2a.1.5.20	Extraction Steam	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	2,335	-
2a.1.5.21	Feedwater	-	185	-	-	-	-	-	28	213	-	-	213	-	-	-	-	-	-	7,102	-
2a.1.5.22	Feedwater - RCA	-	50	7	9	121	51	-	46	284	284	-	-	1,265	218	-	-	-	70,944	1,406	-
2a.1.5.23	Generator & Exciter	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
2a.1.5.24	Generator Gas Cooling	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	247	-
2a.1.5.25	Generator Primary Water	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	2,003	-
2a.1.5.26	Generator Seal Oil	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	232	-
2a.1.5.27	Hydrogen Gas	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	53	-
2a.1.5.28	Main Steam Reheat & Steam Dump	-	30	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	1,105	-
2a.1.5.29	Main Steam Reheat & Steam Dump - RCA	-	389	41	40	540	275	-	257	1,541	1,541	-	-	5,653	1,173	-	-	-	334,792	10,397	-
2a.1.5.30	Main Turbine Lube Oil	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,390	-
2a.1.5.31	Main Turbine Oil Purification	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	2,778	-
2a.1.5.32	Nitrogen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	50	-
2a.1.5.33	Post Accident Sampling	-	7	0	0	0	2	-	2	12	12	-	-	2	9	-	-	-	909	221	-
2a.1.5.34	Process Sampling (uninsulated)	-	8	1	1	18	7	-	7	42	42	-	-	185	31	-	-	-	10,323	265	-
2a.1.5.35	Reactor Coolant	47	101	8	3	20	63	-	68	310	310	-	-	209	271	-	-	-	32,751	3,885	-
2a.1.5.36	Residual Heat Removal	293	204	68	35	342	545	-	397	1,884	1,884	-	-	3,588	2,332	-	-	-	354,449	7,303	-
2a.1.5.37	Safety Injection (insulated)	-	128	10	10	136	69	-	72	424	424	-	-	1,423	294	-	-	-	84,159	3,671	-
2a.1.5.38	Safety Injection (uninsulated)	63	141	-	-	-	-	-	52	256	256	-	(0)	-	-	-	-	-	-	6,474	-
2a.1.5.39	Secondary Plant Sampling	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	1,040	-
2a.1.5.40	Steam Generator Blowdown & Cleanup	-	91	-	-	-	-	-	14	105	-	-	105	-	-	-	-	-	-	3,483	-
2a.1.5.41	Turbine Electrohydr Cntrl (insulated)	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	663	-
2a.1.5.42	Turbine Electrohydr Cntrl (uninsulated)	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	416	-
2a.1.5.43	Turbine Gland Steam & Drains	-	35	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	1,357	-
2a.1.5.44	Turbine Heater Drains	-	327	-	-	-	-	-	49	376	-	-	376	-	-	-	-	-	-	12,600	-
2a.1.5.45	Turbine Plant Cooling (insulated)	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	533	-
2a.1.5.46	Turbine Plant Cooling (uninsulated)	-	117	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	4,495	-
2a.1.5.47	Turbines (High - Low) (insulated)	-	28	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	1,105	-
2a.1.5.48	Turbines (High - Low) (uninsulated)	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	1,703	-
2a.1.5.49	Vent Chilled Water - Non Safety	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	500	-
2a.1.5.50	Vent Chilled Water - Non Safety- RCA	-	117	9	5	63	59	-	55	307	307	-	-	655	252	-	-	-	49,160	2,955	-
2a.1.5.51	Westinghouse Process Instruments	-	3	0	0	1	1	-	1	6	6	-	-	14	2	-	-	-	782	95	-
2a.1.5	Totals	775	5,040	363	296	3,795	2,526	-	2,745	15,540	13,586	-	1,954	39,769	10,852	-	-	-	2,582,830	170,326	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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
2a.1.6	Scaffolding in support of decommissioning	-	435	8	2	37	5	-	117	605	605	-	-	349	22	-	-	-	17,641	17,252	-
2a.1	Subtotal Period 2a Activity Costs	1,403	18,858	11,621	4,266	11,192	36,673	1,375	26,436	111,823	109,869	-	1,954	130,782	85,648	3,156	459	-	12,658,810	353,402	20,415
Period 2a Additional Costs																					
2a.2.1	Retired Reactor Closure Head	-	-	261	477	-	814	-	592	2,145	2,145	-	-	-	3,241	-	-	-	508,950	3,023	2,000
2a.2	Subtotal Period 2a Additional Costs	-	-	261	477	-	814	-	592	2,145	2,145	-	-	-	3,241	-	-	-	508,950	3,023	2,000
Period 2a Collateral Costs																					
2a.3.1	Process liquid waste	134	-	137	384	-	866	-	355	1,877	1,877	-	-	-	1,984	-	-	-	174,286	387	-
2a.3.2	Small tool allowance	-	263	-	-	-	-	-	39	302	272	-	30	-	-	-	-	-	-	-	-
2a.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,386	208	1,594	-	1,594	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	134	263	137	384	-	866	1,386	602	3,773	2,149	1,594	30	-	1,984	-	-	-	174,286	387	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	90	-	-	-	-	-	-	22	112	112	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	554	55	610	610	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	133	13	147	132	-	15	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,318	-	-	-	-	-	579	2,897	2,897	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,209	-	-	-	-	-	481	3,691	3,691	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	16	2	-	230	-	59	307	307	-	-	-	4,753	-	-	-	95,052	22	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,698	255	1,953	1,953	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	1,016	102	1,118	1,118	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	333	33	366	-	366	-	-	-	-	-	-	-	-	-
2a.4.10	Decommissioning Staff Severance	-	-	-	-	-	-	2,557	384	2,941	2,941	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,128	169	1,297	-	1,297	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	65	10	75	-	75	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	513	77	590	590	-	-	-	-	-	-	-	-	-	16,971
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	16,435	2,465	18,901	18,901	-	-	-	-	-	-	-	-	-	234,514
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	26,125	3,919	30,043	30,043	-	-	-	-	-	-	-	-	-	436,629
2a.4	Subtotal Period 2a Period-Dependent Costs	90	5,527	16	2	-	230	50,558	8,624	65,047	63,295	1,738	15	-	4,753	-	-	-	95,052	22	688,114
2a.0	TOTAL PERIOD 2a COST	1,627	24,648	12,036	5,129	11,192	38,583	53,319	36,254	182,787	177,457	3,332	1,999	130,782	95,626	3,156	459	-	13,437,090	356,834	710,529
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Auxiliary Building HVAC (insulated)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2b.1.1.2	Auxiliary Building HVAC (uninsulated)	-	7	0	1	8	1	-	3	19	19	-	-	84	2	-	-	-	3,604	217	-
2b.1.1.3	Batt Rms & Misc Uncontrolled Acc. HVAC	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	53	-
2b.1.1.4	Compressed Air - Instr. Air (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	58	-
2b.1.1.5	Compressed Air - Instrument Air - RCA (i	-	9	1	0	3	4	-	4	22	22	-	-	36	18	-	-	-	3,058	231	-
2b.1.1.6	Compressed Air - Instrument Air - RCA (u	-	105	7	3	31	46	-	44	235	235	-	-	323	196	-	-	-	30,651	2,800	-
2b.1.1.7	Compressed Air - Service Air	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	883	-
2b.1.1.8	Compressed Air - Service Air - RCA	-	122	8	4	43	54	-	52	283	283	-	-	451	232	-	-	-	39,153	3,199	-
2b.1.1.9	Compressed Air -Instr. Air (uninsulated)	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	883	-
2b.1.1.10	Containment Hatches	-	7	0	0	3	2	-	3	16	16	-	-	37	9	-	-	-	2,330	190	-
2b.1.1.11	Containment Hydrogen Purge HVAC	-	35	3	3	43	16	-	20	121	121	-	-	456	70	-	-	-	24,765	1,043	-
2b.1.1.12	Containment Spray	-	330	73	97	1,403	429	-	422	2,754	2,754	-	-	14,700	1,834	-	-	-	761,331	9,328	-
2b.1.1.13	Containmnt Ventilation HVAC (insulated)	-	190	32	40	577	192	-	191	1,221	1,221	-	-	6,044	819	-	-	-	318,902	5,369	-
2b.1.1.14	Containmnt Ventilation HVAC(uninsulated)	-	27	2	4	64	4	-	18	119	119	-	-	668	18	-	-	-	28,729	791	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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)																					
2b.1.1.15	Control Room HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	62	-
2b.1.1.16	Demineralized & RCS Makeup Water	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	911	-
2b.1.1.17	Demineralized & RCS Makeup Water - RCA	-	85	6	3	33	40	-	37	204	204	-	-	343	170	-	-	-	29,188	2,071	-
2b.1.1.18	Diesel Gen & Auxiliaries (insulated)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	182	-
2b.1.1.19	Diesel Gen & Auxiliaries (uninsulated)	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	2,239	-
2b.1.1.20	Diesel Generator Fuel Oil	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	364	-
2b.1.1.21	Diesel Room HVAC	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	117	-
2b.1.1.22	Electrical - Clean	-	1,345	-	-	-	-	-	202	1,547	-	-	1,547	-	-	-	-	-	-	49,165	-
2b.1.1.23	Electrical - Contaminated	-	133	3	6	94	6	-	50	292	292	-	-	989	26	-	-	-	42,522	3,472	-
2b.1.1.24	Electrical - RCA	-	888	24	54	858	56	-	375	2,256	2,256	-	-	8,992	239	-	-	-	386,642	20,767	-
2b.1.1.25	Fire Protection	-	69	-	-	-	-	-	10	79	-	-	79	-	-	-	-	-	-	2,628	-
2b.1.1.26	Fire Protection - RCA	-	177	14	9	113	95	-	88	496	496	-	-	1,182	406	-	-	-	84,403	4,518	-
2b.1.1.27	Leak Rate Test	-	9	1	1	10	5	-	5	30	30	-	-	106	20	-	-	-	6,056	263	-
2b.1.1.28	Potable Water	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
2b.1.1.29	Radiation Monitoring	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	33	-
2b.1.1.30	Safeguards Building HVAC (insulated)	-	15	1	1	22	1	-	8	48	48	-	-	231	6	-	-	-	9,920	356	-
2b.1.1.31	Safeguards Building HVAC (uninsulated)	-	40	1	3	52	3	-	19	119	119	-	-	542	14	-	-	-	23,318	1,154	-
2b.1.1.32	Service Water	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	1,240	-
2b.1.1.33	Service Water - RCA	-	164	21	26	357	148	-	137	853	853	-	-	3,741	630	-	-	-	208,435	4,898	-
2b.1.1.34	Turbine Building HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	92	-
2b.1.1.35	Turbine Building HVAC (uninsulated)	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	722	-
2b.1.1.36	Vents & Drains	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	495	-
2b.1.1.37	Vents & Drains - RCA	69	140	8	4	51	53	-	92	418	418	-	-	538	227	-	-	-	42,230	5,453	-
2b.1.1.38	Waste Management (uninsulated)	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	91	-
2b.1.1.39	Waste Processing Liquid (insulated)	55	120	9	3	17	63	-	77	343	343	-	-	175	268	-	-	-	31,121	4,798	-
2b.1.1.40	Waste Processing Liquid (uninsulated)	28	57	5	2	10	35	-	39	176	176	-	-	110	152	-	-	-	17,788	2,309	-
2b.1.1.41	Waste Processing Solid	-	2	0	0	1	1	-	1	5	5	-	-	9	5	-	-	-	812	53	-
2b.1.1	Totals	152	4,300	217	265	3,794	1,254	-	1,931	11,913	10,029	-	1,884	39,756	5,363	-	-	-	2,094,944	133,533	-
2b.1.2	Scaffolding in support of decommissioning	-	544	10	3	46	6	-	146	756	756	-	-	436	27	-	-	-	22,051	21,565	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,045	663	162	63	293	986	-	1,004	4,217	4,217	-	-	3,072	7,255	-	-	-	814,888	49,489	-
2b.1.3.2	Safeguard	138	67	17	8	61	42	-	108	441	441	-	-	644	705	-	-	-	95,457	5,679	-
2b.1.3	Totals	1,183	730	179	71	355	1,028	-	1,113	4,658	4,658	-	-	3,717	7,961	-	-	-	910,345	55,168	-
2b.1	Subtotal Period 2b Activity Costs	1,335	5,574	406	339	4,195	2,288	-	3,190	17,326	15,442	-	1,884	43,908	13,351	-	-	-	3,027,341	210,266	-
Period 2b Collateral Costs																					
2b.3.1	Process liquid waste	127	-	68	187	-	319	-	178	878	878	-	-	-	977	-	-	-	64,173	191	-
2b.3.2	Small tool allowance	-	121	-	-	-	-	-	18	139	139	-	-	-	-	-	-	-	-	-	-
2b.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,458	2,019	15,476	-	15,476	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	127	121	68	187	-	319	13,458	2,215	16,494	1,017	15,476	-	-	977	-	-	-	64,173	191	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	854	-	-	-	-	-	-	213	1,067	1,067	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	941	94	1,036	1,036	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	226	23	249	249	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,919	-	-	-	-	-	480	2,398	2,398	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,406	-	-	-	-	-	811	6,217	6,217	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	10	1	-	150	-	39	200	200	-	-	-	3,095	-	-	-	61,893	14	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,277	342	2,618	2,618	-	-	-	-	-	-	-	-	-	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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 2b Period-Dependent Costs (continued)																					
2b.4.8	NRC Fees	-	-	-	-	-	-	1,726	173	1,898	1,898	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	565	56	621	-	621	-	-	-	-	-	-	-	-	-
2b.4.10	Decommissioning Staff Severance	-	-	-	-	-	-	1,677	252	1,929	1,929	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,915	287	2,203	-	2,203	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	481	72	553	553	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	110	17	127	-	127	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	871	131	1,001	1,001	-	-	-	-	-	-	-	-	-	28,820
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	18,685	2,803	21,488	21,488	-	-	-	-	-	-	-	-	-	282,950
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	30,528	4,579	35,107	35,107	-	-	-	-	-	-	-	-	-	526,620
2b.4	Subtotal Period 2b Period-Dependent Costs	854	7,324	10	1	-	150	60,003	10,370	78,713	75,762	2,951	-	-	3,095	-	-	-	61,893	14	838,400
2b.0	TOTAL PERIOD 2b COST	2,316	13,019	484	526	4,195	2,757	73,461	15,775	112,532	92,221	18,427	1,884	43,908	17,423	-	-	-	3,153,406	210,471	838,400
PERIOD 2c - Decontamination Following Wet Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Remove spent fuel racks	124	11	70	6	-	257	-	137	607	607	-	-	-	1,098	-	-	-	98,510	428	-
Disposal of Plant Systems																					
2c.1.2.1	Fuel Building HVAC (uninsulated)	-	5	0	0	5	0	-	2	14	14	-	-	56	1	-	-	-	2,405	169	-
2c.1.2.2	Fuel Handling	-	5	0	0	6	2	-	3	17	17	-	-	65	10	-	-	-	3,557	150	-
2c.1.2.3	Spent Fuel Pool Cooling & Cleanup	-	114	7	3	24	54	-	47	249	249	-	-	250	230	-	-	-	30,730	3,129	-
2c.1.2	Totals	-	125	8	4	35	56	-	52	280	280	-	-	371	241	-	-	-	36,692	3,448	-
Decontamination of Site Buildings																					
2c.1.3	Totals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2c.1.4	Scaffolding in support of decommissioning	-	109	2	1	9	1	-	29	151	151	-	-	87	5	-	-	-	4,410	4,313	-
2c.1	Subtotal Period 2c Activity Costs	124	245	80	11	45	315	-	218	1,038	1,038	-	-	458	1,344	-	-	-	139,612	8,190	-
Period 2c Additional Costs																					
2c.2.1	License Termination Survey Planning	-	-	-	-	-	-	655	197	852	852	-	-	-	-	-	-	-	-	-	6,240
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	655	197	852	852	-	-	-	-	-	-	-	-	-	6,240
Period 2c Collateral Costs																					
2c.3.1	Process liquid waste	78	-	37	102	-	160	-	98	474	474	-	-	-	535	-	-	-	32,102	104	-
2c.3.2	Small tool allowance	-	7	-	-	-	-	-	1	8	8	-	-	-	-	-	-	-	-	-	-
2c.3.3	Decommissioning Equipment Disposition	-	-	140	50	634	87	-	138	1,050	1,050	-	-	6,000	373	-	-	-	303,507	88	-
2c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	360	54	415	-	415	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	78	7	177	152	634	247	360	291	1,946	1,532	415	-	6,000	908	-	-	-	335,608	192	-
Period 2c Period-Dependent Costs																					
2c.4.1	Decon supplies	5	-	-	-	-	-	-	1	6	6	-	-	-	-	-	-	-	-	-	-
2c.4.2	Insurance	-	-	-	-	-	-	30	3	33	33	-	-	-	-	-	-	-	-	-	-
2c.4.3	Property taxes	-	-	-	-	-	-	7	1	8	8	-	-	-	-	-	-	-	-	-	-
2c.4.4	Health physics supplies	-	65	-	-	-	-	-	16	81	81	-	-	-	-	-	-	-	-	-	-
2c.4.5	Heavy equipment rental	-	171	-	-	-	-	-	26	197	197	-	-	-	-	-	-	-	-	-	-
2c.4.6	Disposal of DAW generated	-	-	1	0	-	17	-	4	23	23	-	-	-	351	-	-	-	7,011	2	-
2c.4.7	Plant energy budget	-	-	-	-	-	-	38	6	44	44	-	-	-	-	-	-	-	-	-	-
2c.4.8	NRC Fees	-	-	-	-	-	-	55	5	60	60	-	-	-	-	-	-	-	-	-	-
2c.4.9	Emergency Planning Fees	-	-	-	-	-	-	18	2	20	-	20	-	-	-	-	-	-	-	-	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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 2c Period-Dependent Costs (continued)																					
2c.4.10	Decommissioning Staff Severance	-	-	-	-	-	-	1,637	245	1,882	1,882	-	-	-	-	-	-	-	-	-	-
2c.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	30	5	35	35	-	-	-	-	-	-	-	-	-	-
2c.4.12	ISFSI Operating Costs	-	-	-	-	-	-	3	1	4	-	4	-	-	-	-	-	-	-	-	-
2c.4.13	Security Staff Cost	-	-	-	-	-	-	15	2	17	17	-	-	-	-	-	-	-	-	-	497
2c.4.14	DOC Staff Cost	-	-	-	-	-	-	401	60	461	461	-	-	-	-	-	-	-	-	-	6,049
2c.4.15	Utility Staff Cost	-	-	-	-	-	-	571	86	657	657	-	-	-	-	-	-	-	-	-	10,026
2c.4	Subtotal Period 2c Period-Dependent Costs	5	236	1	0	-	17	2,805	463	3,527	3,504	24	-	-	351	-	-	-	7,011	2	16,571
2c.0	TOTAL PERIOD 2c COST	207	487	258	162	679	579	3,821	1,169	7,364	6,925	438	-	6,458	2,603	-	-	-	482,231	8,384	22,811
PERIOD 2d - Delay before License Termination																					
Period 2d Direct Decommissioning Activities																					
Period 2d Collateral Costs																					
2d.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	10,194	1,529	11,724	-	11,724	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	-	-	-	-	-	-	10,194	1,529	11,724	-	11,724	-	-	-	-	-	-	-	-	-
Period 2d Period-Dependent Costs																					
2d.4.1	Insurance	-	-	-	-	-	-	1,400	140	1,540	1,540	-	-	-	-	-	-	-	-	-	-
2d.4.2	Property taxes	-	-	-	-	-	-	336	34	370	370	-	-	-	-	-	-	-	-	-	-
2d.4.3	Health physics supplies	-	243	-	-	-	-	-	61	304	304	-	-	-	-	-	-	-	-	-	-
2d.4.4	Disposal of DAW generated	-	-	1	0	-	13	-	3	17	17	-	-	-	263	-	-	-	5,268	1	-
2d.4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2d.4.6	NRC Fees	-	-	-	-	-	-	648	65	712	712	-	-	-	-	-	-	-	-	-	-
2d.4.7	Emergency Planning Fees	-	-	-	-	-	-	840	84	924	-	924	-	-	-	-	-	-	-	-	-
2d.4.8	ISFSI Operating Costs	-	-	-	-	-	-	164	25	189	-	189	-	-	-	-	-	-	-	-	-
2d.4.9	Security Staff Cost	-	-	-	-	-	-	707	106	813	813	-	-	-	-	-	-	-	-	-	23,383
2d.4.10	Utility Staff Cost	-	-	-	-	-	-	3,058	459	3,517	3,517	-	-	-	-	-	-	-	-	-	54,560
2d.4	Subtotal Period 2d Period-Dependent Costs	-	243	1	0	-	13	7,153	976	8,386	7,273	1,113	-	-	263	-	-	-	5,268	1	77,943
2d.0	TOTAL PERIOD 2d COST	-	243	1	0	-	13	17,348	2,505	20,109	7,273	12,837	-	-	263	-	-	-	5,268	1	77,943
PERIOD 2e - License Termination																					
Period 2e Direct Decommissioning Activities																					
2e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
2e.1.2	Terminate license									a											
2e.1	Subtotal Period 2e Activity Costs	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
Period 2e Additional Costs																					
2e.2.1	License Termination Survey	-	-	-	-	-	-	3,256	977	4,233	4,233	-	-	-	-	-	-	-	-	86,835	3,120
2e.2	Subtotal Period 2e Additional Costs	-	-	-	-	-	-	3,256	977	4,233	4,233	-	-	-	-	-	-	-	-	86,835	3,120
Period 2e Collateral Costs																					
2e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
2e.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	83	12	95	-	95	-	-	-	-	-	-	-	-	-
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	1,568	235	1,804	1,709	95	-	-	-	-	-	-	-	-	-
Period 2e Period-Dependent Costs																					
2e.4.1	Insurance	-	-	-	-	-	-	248	25	273	273	-	-	-	-	-	-	-	-	-	-
2e.4.2	Property taxes	-	-	-	-	-	-	68	7	75	75	-	-	-	-	-	-	-	-	-	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2e Period-Dependent Costs (continued)																					
2e.4.3	Health physics supplies	-	473	-	-	-	-	-	118	592	592	-	-	-	-	-	-	-	-	-	-
2e.4.4	Disposal of DAW generated	-	-	1	0	-	12	-	3	16	16	-	-	-	249	-	-	-	4,974	1	-
2e.4.5	Plant energy budget	-	-	-	-	-	-	182	27	209	209	-	-	-	-	-	-	-	-	-	-
2e.4.6	NRC Fees	-	-	-	-	-	-	556	56	612	612	-	-	-	-	-	-	-	-	-	-
2e.4.7	Emergency Planning Fees	-	-	-	-	-	-	169	17	186	-	186	-	-	-	-	-	-	-	-	-
2e.4.8	Decommissioning Staff Severance	-	-	-	-	-	-	910	137	1,047	1,047	-	-	-	-	-	-	-	-	-	-
2e.4.9	ISFSI Operating Costs	-	-	-	-	-	-	33	5	38	-	38	-	-	-	-	-	-	-	-	-
2e.4.10	Security Staff Cost	-	-	-	-	-	-	934	140	1,074	1,074	-	-	-	-	-	-	-	-	-	27,893
2e.4.11	DOC Staff Cost	-	-	-	-	-	-	3,225	484	3,709	3,709	-	-	-	-	-	-	-	-	-	46,750
2e.4.12	Utility Staff Cost	-	-	-	-	-	-	3,805	571	4,376	4,376	-	-	-	-	-	-	-	-	-	60,107
2e.4	Subtotal Period 2e Period-Dependent Costs	-	473	1	0	-	12	10,131	1,589	12,207	11,983	224	-	-	249	-	-	-	4,974	1	134,750
2e.0	TOTAL PERIOD 2e COST	-	473	1	0	-	12	15,107	2,847	18,440	18,121	320	-	-	249	-	-	-	4,974	86,836	137,870
PERIOD 2 TOTALS		4,150	38,871	12,780	5,818	16,066	41,943	163,055	58,550	341,233	301,997	35,353	3,883	181,149	116,164	3,156	459	-	17,082,970	662,525	1,787,553
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	5,679	-	-	-	-	-	852	6,531	-	-	6,531	-	-	-	-	-	-	79,426	-
3b.1.1.2	Circ Water Yard Piping	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	36	-
3b.1.1.3	Diesel Generator	-	605	-	-	-	-	-	91	695	-	-	695	-	-	-	-	-	-	8,908	-
3b.1.1.4	Old Steam Generator Storage Facility	-	946	-	-	-	-	-	142	1,087	-	-	1,087	-	-	-	-	-	-	11,858	-
3b.1.1.5	Safeguard	-	2,051	-	-	-	-	-	308	2,358	-	-	2,358	-	-	-	-	-	-	30,287	-
3b.1.1.6	Switchgear	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	2,049	-
3b.1.1.7	Turbine	-	550	-	-	-	-	-	82	632	-	-	632	-	-	-	-	-	-	11,258	-
3b.1.1.8	Turbine Pedestal	-	1,188	-	-	-	-	-	178	1,366	-	-	1,366	-	-	-	-	-	-	15,907	-
3b.1.1	Totals	-	11,147	-	-	-	-	-	1,672	12,819	-	-	12,819	-	-	-	-	-	-	159,729	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	477	-	-	-	-	-	72	549	-	-	549	-	-	-	-	-	-	1,292	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	192	29	221	221	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	11,624	-	-	-	-	192	1,772	13,589	221	-	13,368	-	-	-	-	-	-	161,021	1,560
Period 3b Additional Costs																					
3b.2.1	Concrete Processing	-	529	-	-	-	-	2	80	611	-	-	611	-	-	-	-	-	-	2,483	-
3b.2	Subtotal Period 3b Additional Costs	-	529	-	-	-	-	2	80	611	-	-	611	-	-	-	-	-	-	2,483	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	96	-	-	-	-	-	14	111	-	-	111	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	219	33	252	-	252	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	96	-	-	-	-	219	47	362	-	252	111	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	328	33	361	-	361	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	180	18	198	-	198	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,136	-	-	-	-	-	920	7,056	-	-	7,056	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	241	36	277	(0)	55	222	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	250	25	275	-	275	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	448	45	493	-	493	-	-	-	-	-	-	-	-	-

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3b Period-Dependent Costs (continued)																					
3b.4.7	Decommissioning Staff Severance	-	-	-	-	-	-	1,422	213	1,635	1,635	-	-	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	88	13	101	-	101	-	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	2,362	354	2,716	0	2,227	489	-	-	-	-	-	-	-	70,221
3b.4.10	*DOC Staff Cost*	-	-	-	-	-	-	7,431	1,115	8,546	-	-	8,546	-	-	-	-	-	-	-	110,240
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	4,448	667	5,115	(0)	1,023	4,092	-	-	-	-	-	-	-	70,221
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,136	-	-	-	-	17,197	3,440	26,773	1,635	4,733	20,405	-	-	-	-	-	-	-	250,682
3b.0	TOTAL PERIOD 3b COST	-	18,386	-	-	-	-	17,610	5,339	41,335	1,856	4,984	34,495	-	-	-	-	-	-	163,504	252,242
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,509	376	2,885	-	2,885	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	2,509	376	2,885	-	2,885	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	3,752	375	4,127	-	4,127	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	2,054	205	2,260	-	2,260	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	*NRC ISFSI Fees*	-	-	-	-	-	-	2,856	286	3,142	-	3,142	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	5,131	513	5,644	-	5,644	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,003	150	1,153	-	1,153	-	-	-	-	-	-	-	-	-
3c.4.7	Security Staff Cost	-	-	-	-	-	-	22,168	3,325	25,493	-	25,493	-	-	-	-	-	-	-	-	642,523
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	10,170	1,525	11,695	-	11,695	-	-	-	-	-	-	-	-	160,869
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	47,134	6,380	53,515	-	53,515	-	-	-	-	-	-	-	-	803,392
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	49,643	6,757	56,400	-	56,400	-	-	-	-	-	-	-	-	803,392
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	463	-	-	10,837	-	1,672	12,972	12,972	-	-	-	-	-	-	505	104,146	-	-
3d.1.1	Totals	-	-	463	-	-	10,837	-	1,672	12,972	12,972	-	-	-	-	-	-	505	104,146	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	463	-	-	10,837	-	1,672	12,972	12,972	-	-	-	-	-	-	505	104,146	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	6	1	7	-	7	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	3	0	4	-	4	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	9	1	9	-	9	-	-	-	-	-	-	-	-	-
3d.4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.6	*Security Staff Cost*	-	-	-	-	-	-	37	6	43	-	43	-	-	-	-	-	-	-	-	1,080
3d.4.7	Utility Staff Cost	-	-	-	-	-	-	17	3	20	-	20	-	-	-	-	-	-	-	-	270
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	74	10	85	-	85	-	-	-	-	-	-	-	-	1,350
3d.0	TOTAL PERIOD 3d COST	-	-	463	-	-	10,837	74	1,682	13,056	12,972	85	-	-	-	-	-	505	104,146	-	1,350

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	ISFSI License Termination	-	23	1	8	-	371	696	204	1,304	-	1,304	-	-	1,701	-	-	-	142,522	2,565	1,280
3e.2	Subtotal Period 3e Additional Costs	-	23	1	8	-	371	696	204	1,304	-	1,304	-	-	1,701	-	-	-	142,522	2,565	1,280
Period 3e Collateral Costs																					
3e.3.1	Small tool allowance	-	0	-	-	-	-	-	0	0	-	0	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	0	-	-	-	-	-	0	0	-	0	-	-	-	-	-	-	-	-	-
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	54	5	59	-	59	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	30	3	33	-	33	-	-	-	-	-	-	-	-	-
3e.4.3	Heavy equipment rental	-	274	-	-	-	-	-	41	315	-	315	-	-	-	-	-	-	-	-	-
3e.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3e.4.5	ISFSI Operating Costs	-	-	-	-	-	-	14	2	17	-	17	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	85	13	98	-	98	-	-	-	-	-	-	-	-	2,489
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	119	18	137	-	137	-	-	-	-	-	-	-	-	1,886
3e.4	Subtotal Period 3e Period-Dependent Costs	-	274	-	-	-	-	303	82	659	-	659	-	-	-	-	-	-	-	-	4,375
3e.0	TOTAL PERIOD 3e COST	-	297	1	8	-	371	999	287	1,964	-	1,964	-	-	1,701	-	-	-	142,522	2,565	5,655
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	ISFSI Demolition and Site Restoration	-	724	-	-	-	-	25	112	860	-	860	-	-	-	-	-	-	-	14,350	80
3f.2	Subtotal Period 3f Additional Costs	-	724	-	-	-	-	25	112	860	-	860	-	-	-	-	-	-	-	14,350	80
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	8	-	-	-	-	-	1	10	-	10	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	8	-	-	-	-	-	1	10	-	10	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	15	1	16	-	16	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	106	-	-	-	-	-	16	122	-	122	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.5	Security Staff Cost	-	-	-	-	-	-	43	6	49	-	49	-	-	-	-	-	-	-	-	1,245
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	50	7	57	-	57	-	-	-	-	-	-	-	-	771
3f.4	Subtotal Period 3f Period-Dependent Costs	-	106	-	-	-	-	107	31	244	-	244	-	-	-	-	-	-	-	-	2,016
3f.0	TOTAL PERIOD 3f COST	-	838	-	-	-	-	132	145	1,114	-	1,114	-	-	-	-	-	-	-	14,350	2,096
PERIOD 3 TOTALS		-	19,521	463	8	-	11,208	68,459	14,209	113,869	14,827	64,547	34,495	-	1,701	-	-	505	246,668	180,419	1,064,734
TOTAL COST TO DECOMMISSION		7,325	60,909	13,329	6,059	16,066	56,692	315,785	87,990	564,156	421,223	103,031	39,902	181,149	119,033	3,986	459	505	17,459,950	871,918	3,691,438

Table C-1
Comanche Peak Nuclear Power Plant, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2009 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 18.48% CONTINGENCY:	$564,156	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 74.66% OR:	$421,223	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 18.26% OR:	$103,031	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 7.07% OR:	$39,902	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	123,478	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	61,834	tons
TOTAL CRAFT LABOR REQUIREMENTS:	871,918	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

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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	Prepare preliminary decommissioning cost	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	556
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	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	856
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	242	36	279	279	-	-	-	-	-	-	-	-	-	1,969
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	3,210
1a.1.13	Perform SER and EA	-	-	-	-	-	-	163	24	188	188	-	-	-	-	-	-	-	-	-	1,327
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	263	40	303	303	-	-	-	-	-	-	-	-	-	2,140
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	216	32	248	248	-	-	-	-	-	-	-	-	-	1,753
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	259	39	298	268	-	30	-	-	-	-	-	-	-	2,106
1a.1.17.2	Plant systems	-	-	-	-	-	-	219	33	252	227	-	25	-	-	-	-	-	-	-	1,783
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	26	4	30	30	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	374	56	430	430	-	-	-	-	-	-	-	-	-	3,039
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	342	51	394	394	-	-	-	-	-	-	-	-	-	2,782
1a.1.17.6	Biological shield	-	-	-	-	-	-	26	4	30	30	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,335
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	84	13	97	48	-	48	-	-	-	-	-	-	-	685
1a.1.17.9	Main Turbine	-	-	-	-	-	-	21	3	24	-	-	24	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	21	3	24	-	-	24	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	164	25	189	94	-	94	-	-	-	-	-	-	-	1,335
1a.1.17.12	Waste management	-	-	-	-	-	-	242	36	279	279	-	-	-	-	-	-	-	-	-	1,969
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	47	7	55	27	-	27	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,992	299	2,291	2,017	-	274	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	1,027
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	74	11	85	85	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	8,885	1,333	10,217	9,944	-	274	-	-	-	-	-	-	-	31,566
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,228	1,084	8,312	-	8,312	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	7,228	1,084	8,312	-	8,312	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,005	101	1,106	1,106	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	90	9	99	99	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	404	-	-	-	-	-	101	505	505	-	-	-	-	-	-	-	-	-	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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 Period-Dependent Costs (continued)																					
1a.4.4	Heavy equipment rental	-	514	-	-	-	-	-	77	591	591	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	0	-	24	-	6	32	32	-	-	-	493	-	-	-	9,854	2	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,208	181	1,390	1,390	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	485	48	533	533	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	445	44	489	-	489	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	762	114	877	-	877	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	4,999	750	5,749	5,749	-	-	-	-	-	-	-	-	-	157,471
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	24,777	3,717	28,493	28,493	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	918	2	0	-	24	33,816	5,155	39,915	38,498	1,416	-	-	493	-	-	-	9,854	2	580,871
1a.0	TOTAL PERIOD 1a COST	-	918	2	0	-	24	49,928	7,572	58,444	48,442	9,729	274	-	493	-	-	-	9,854	2	612,438
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	249	37	287	258	-	29	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor Internals	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	71	11	82	20	-	61	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	191	29	220	220	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.9	Facility closeout	-	-	-	-	-	-	63	9	73	36	-	36	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	24	4	27	27	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	63	9	73	73	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	242	36	279	279	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	53	8	61	30	-	30	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	82	12	94	-	-	94	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	82	12	94	-	-	94	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	144	22	165	149	-	17	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	144	22	165	149	-	17	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,751	263	2,014	1,635	-	379	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	696	-	-	-	-	-	-	348	1,044	1,044	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	696	-	-	-	-	-	1,751	611	3,058	2,679	-	379	-	-	-	-	-	-	1,067	14,228
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	1,849	555	2,404	2,404	-	-	-	-	-	-	-	-	11,831	4,332
1b.2.2	Spent fuel pool isolation	-	-	-	-	-	-	6,460	969	7,429	7,429	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	8,309	1,524	9,832	9,832	-	-	-	-	-	-	-	-	11,831	4,332
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	991	-	-	-	-	-	-	149	1,140	1,140	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process liquid waste	56	-	83	233	-	3,502	-	947	4,822	4,822	-	-	-	372	829	-	-	114,407	234	-
1b.3.4	Small tool allowance	-	2	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1b.3.5	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1b Collateral Costs (continued)																					
1b.3.6	Decon rig	1,400	-	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
1b.3.7	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,272	341	2,612	-	2,612	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,448	1,102	83	233	-	3,502	3,757	2,035	13,161	10,548	2,612	-	-	372	829	-	-	114,407	234	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	31	-	-	-	-	-	-	8	38	38	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	509	51	560	560	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	46	5	50	50	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	237	-	-	-	-	-	59	296	296	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	261	-	-	-	-	-	39	300	300	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	1	0	-	15	-	4	20	20	-	-	-	303	-	-	-	6,050	1	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,225	184	1,409	1,409	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	246	25	270	270	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	225	23	248	-	248	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	386	58	444	-	444	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	22	3	26	-	26	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	2,534	380	2,914	2,914	-	-	-	-	-	-	-	-	-	79,814
1b.4.13	DOC Staff Cost	-	-	-	-	-	-	4,687	703	5,390	5,390	-	-	-	-	-	-	-	-	-	64,486
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	12,636	1,895	14,531	14,531	-	-	-	-	-	-	-	-	-	215,657
1b.4	Subtotal Period 1b Period-Dependent Costs	31	497	1	0	-	15	22,517	3,436	26,496	25,778	718	-	-	303	-	-	-	6,050	1	359,957
1b.0	TOTAL PERIOD 1b COST	3,175	1,599	84	234	-	3,517	36,334	7,605	52,547	48,838	3,330	379	-	675	829	-	-	120,457	13,133	378,517
PERIOD 1 TOTALS		3,175	2,517	86	234	-	3,540	86,262	15,177	110,992	97,280	13,059	652	-	1,168	829	-	-	130,311	13,136	990,955
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	71	84	16	6	-	228	-	116	521	521	-	-	-	722	-	-	-	87,332	4,301	-
2a.1.1.2	Pressurizer Relief Tank	18	16	7	3	-	95	-	38	178	178	-	-	-	329	-	-	-	36,553	1,072	-
2a.1.1.3	Reactor Coolant Pumps & Motors	69	59	154	115	-	2,030	-	589	3,017	3,017	-	-	-	7,231	-	-	-	792,800	4,595	100
2a.1.1.4	Pressurizer	25	32	382	74	-	967	-	312	1,792	1,792	-	-	-	3,445	-	-	-	251,421	2,415	938
2a.1.1.5	Steam Generators	227	3,087	1,964	1,264	2,946	6,568	-	3,355	19,411	19,411	-	-	40,067	23,397	-	-	-	3,329,768	23,233	2,125
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	92	68	263	19	-	312	-	170	925	925	-	-	-	4,852	-	-	-	119,556	4,524	-
2a.1.1.7	Reactor Vessel Internals	72	2,241	5,079	510	-	8,051	242	7,176	23,370	23,370	-	-	-	1,377	903	459	-	326,029	26,933	1,209
2a.1.1.8	Reactor Vessel	54	4,210	1,544	319	-	8,586	242	7,980	22,937	22,937	-	-	-	6,606	2,254	-	-	978,589	26,933	1,209
2a.1.1	Totals	629	9,798	9,409	2,310	2,946	26,839	484	19,737	72,150	72,150	-	-	40,067	47,959	3,156	459	-	5,922,097	94,008	5,582
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	248	333	74	747	462	-	334	2,198	2,198	-	-	3,742	2,084	-	-	-	505,024	8,194	-
2a.1.3	Main Condensers	-	771	194	56	714	466	-	444	2,645	2,645	-	-	6,756	1,992	-	-	-	482,702	25,500	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	1,002	-	-	-	-	-	150	1,152	1,152	-	-	-	-	-	-	-	-	13,996	-
2a.1.4.2	Auxiliary	-	472	-	-	-	-	-	71	542	542	-	-	-	-	-	-	-	-	6,783	-
2a.1.4.3	Safeguard	-	108	-	-	-	-	-	16	124	124	-	-	-	-	-	-	-	-	1,588	-
2a.1.4.4	Fuel	-	467	-	-	-	-	-	70	537	537	-	-	-	-	-	-	-	-	6,652	-
2a.1.4	Totals	-	2,048	-	-	-	-	-	307	2,355	2,355	-	-	-	-	-	-	-	-	29,019	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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																					
2a.1.5.1	Auxiliary Feedwater (insulated)	-	519	43	50	717	223	-	305	1,858	1,858	-	-	7,517	999	-	-	-	390,707	14,049	-
2a.1.5.2	Auxiliary Steam	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	3,676	-
2a.1.5.3	Boron Recycle (insulated)	15	32	2	1	6	14	-	20	90	90	-	-	67	60	-	-	-	8,135	1,291	-
2a.1.5.4	Boron Recycle (uninsulated)	226	309	32	23	301	191	-	290	1,372	1,372	-	-	3,154	982	-	-	-	201,319	15,635	-
2a.1.5.5	Boron Thermal Regeneration (insulated)	35	74	5	2	17	38	-	49	219	219	-	-	179	161	-	-	-	21,715	2,867	-
2a.1.5.6	Boron Thermal Regeneration (uninsulated)	97	197	16	7	71	112	-	139	638	638	-	-	743	492	-	-	-	72,989	7,853	-
2a.1.5.7	Carbon Dioxide Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	20	-
2a.1.5.8	Chemical & Volume Control (insulated)	80	174	11	4	37	82	-	111	499	499	-	-	389	349	-	-	-	47,099	6,854	-
2a.1.5.9	Chemical & Volume Control (uninsulated)	263	456	40	24	283	271	-	363	1,700	1,700	-	-	2,968	1,270	-	-	-	224,227	20,003	-
2a.1.5.10	Chemical Feed	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	421	-
2a.1.5.11	Chemical Feed - RCA	-	7	0	0	-	2	-	3	13	13	-	-	-	10	-	-	-	935	253	-
2a.1.5.12	Chilled Water - Safety	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	159	-
2a.1.5.13	Chilled Water - Safety - RCA	-	88	6	3	32	38	-	37	203	203	-	-	332	162	-	-	-	27,976	2,209	-
2a.1.5.14	Chlorine	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	369	-
2a.1.5.15	Circulating Water	-	273	-	-	-	-	-	41	314	-	-	314	-	-	-	-	-	-	10,429	-
2a.1.5.16	Component Cooling Water	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	763	-
2a.1.5.17	Component Cooling Water - RCA	-	947	119	126	1,715	804	-	726	4,436	4,436	-	-	17,972	3,436	-	-	-	1,038,029	25,662	-
2a.1.5.18	Condensate (insulated)	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	4,373	-
2a.1.5.19	Condensate (uninsulated)	-	95	-	-	-	-	-	14	110	-	-	110	-	-	-	-	-	-	3,541	-
2a.1.5.20	Condensate Polishing	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	3,327	-
2a.1.5.21	Condenser Vacuum & Water Box Priming	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	2,017	-
2a.1.5.22	Extraction Steam	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,806	-
2a.1.5.23	Feedwater	-	185	-	-	-	-	-	28	213	-	-	213	-	-	-	-	-	-	7,084	-
2a.1.5.24	Feedwater - RCA	-	52	8	9	124	52	-	47	292	292	-	-	1,301	223	-	-	-	72,834	1,458	-
2a.1.5.25	Generator & Exciter	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
2a.1.5.26	Generator Gas Cooling	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	247	-
2a.1.5.27	Generator Primary Water	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,745	-
2a.1.5.28	Generator Seal Oil	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	218	-
2a.1.5.29	Hydrogen Gas	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	54	-
2a.1.5.30	Main Steam Reheat & Steam Dump	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	1,136	-
2a.1.5.31	Main Steam Reheat & Steam Dump - RCA	-	385	40	39	532	268	-	253	1,517	1,517	-	-	5,577	1,143	-	-	-	328,985	10,308	-
2a.1.5.32	Main Turbine Lube Oil	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,383	-
2a.1.5.33	Main Turbine Oil Purification	-	70	-	-	-	-	-	11	81	-	-	81	-	-	-	-	-	-	2,663	-
2a.1.5.34	Nitrogen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
2a.1.5.35	Oxygen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	42	-
2a.1.5.36	Post Accident Sampling	-	7	0	0	0	2	-	2	12	12	-	-	2	9	-	-	-	909	221	-
2a.1.5.37	Process Sampling (uninsulated)	-	8	1	1	18	7	-	7	42	42	-	-	185	31	-	-	-	10,323	265	-
2a.1.5.38	Reactor Coolant	46	101	8	3	20	63	-	68	310	310	-	-	214	267	-	-	-	32,646	3,908	-
2a.1.5.39	Reservoir Makeup Water	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	2,790	-
2a.1.5.40	Reservoir Return Water	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	2,095	-
2a.1.5.41	Reservoir Service Tower	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	308	-
2a.1.5.42	Residual Heat Removal	286	203	67	34	337	542	-	392	1,861	1,861	-	-	3,529	2,317	-	-	-	351,078	7,033	-
2a.1.5.43	Safety Injection (insulated)	-	101	10	10	138	69	-	66	395	395	-	-	1,451	295	-	-	-	85,411	2,704	-
2a.1.5.44	Safety Injection (uninsulated)	-	304	34	58	888	122	-	252	1,657	1,657	-	-	9,308	592	-	-	-	424,574	9,160	-
2a.1.5.45	Secondary Plant Sampling	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	1,040	-
2a.1.5.46	Steam Generator Blowdown & Cleanup	-	112	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	4,265	-
2a.1.5.47	Turbine Electrohydr Cntrl (insulated)	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	838	-
2a.1.5.48	Turbine Electrohydr Cntrl (uninsulated)	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	552	-
2a.1.5.49	Turbine Gland Steam & Drains	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	1,133	-
2a.1.5.50	Turbine Heater Drains	-	319	-	-	-	-	-	48	367	-	-	367	-	-	-	-	-	-	12,296	-
2a.1.5.51	Turbine Plant Cooling (insulated)	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	549	-
2a.1.5.52	Turbine Plant Cooling (uninsulated)	-	115	-	-	-	-	-	17	133	-	-	133	-	-	-	-	-	-	4,420	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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.1.5.53	Turbines (HIGH - LOW) (insulated)	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	156	-
2a.1.5.54	Turbines (HIGH - LOW) (uninsulated)	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	474	-
2a.1.5.55	Vent Chilled Water - Non Safety	-	63	-	-	-	-	-	9	73	-	-	73	-	-	-	-	-	-	2,423	-
2a.1.5.56	Vent Chilled Water - Non Safety - RCA	-	529	42	34	446	281	-	279	1,611	1,611	-	-	4,673	1,202	-	-	-	297,550	13,724	-
2a.1.5.57	Westinghouse Process Instruments	-	3	0	0	2	1	-	1	7	7	-	-	16	3	-	-	-	913	111	-
2a.1.5	Totals	1,047	6,563	485	429	5,686	3,181	-	3,719	21,110	18,732	-	2,378	59,579	14,004	-	-	-	3,638,353	224,459	-
2a.1.6	Scaffolding in support of decommissioning	-	1,058	31	9	139	19	-	295	1,550	1,550	-	-	1,313	82	-	-	-	66,395	40,258	-
2a.1	Subtotal Period 2a Activity Costs	1,676	20,485	10,451	2,878	10,232	30,968	484	24,835	102,009	99,631	-	2,378	111,456	66,120	3,156	459	-	10,614,570	421,438	5,582
Period 2a Additional Costs																					
2a.2.1	Retired HP & LP Turbine Rotors	-	-	340	56	-	1,244	-	353	1,993	1,993	-	-	-	5,014	-	-	-	696,000	1,200	1,000
2a.2	Subtotal Period 2a Additional Costs	-	-	340	56	-	1,244	-	353	1,993	1,993	-	-	-	5,014	-	-	-	696,000	1,200	1,000
Period 2a Collateral Costs																					
2a.3.1	Process liquid waste	234	-	189	525	-	1,104	-	491	2,543	2,543	-	-	-	2,727	-	-	-	222,065	532	-
2a.3.2	Small tool allowance	-	277	-	-	-	-	-	41	318	286	-	32	-	-	-	-	-	-	-	-
2a.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,575	986	7,561	-	7,561	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	234	277	189	525	-	1,104	6,575	1,518	10,422	2,829	7,561	32	-	2,727	-	-	-	222,065	532	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	88	-	-	-	-	-	-	22	110	110	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	545	55	600	600	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	131	13	144	130	-	14	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,624	-	-	-	-	-	656	3,280	3,280	-	-	-	-	-	-	-	-	-	-
2a.4.5	*Heavy equipment rental*	-	3,156	-	-	-	-	-	473	3,629	3,629	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	19	2	-	279	-	72	372	372	-	-	-	5,757	-	-	-	135,142	26	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,670	250	1,920	1,920	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	673	67	741	741	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	327	33	360	-	360	-	-	-	-	-	-	-	-	-
2a.4.10	Decommissioning Staff Severance	-	-	-	-	-	-	2,557	384	2,941	2,941	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,109	166	1,275	-	1,275	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	64	10	74	-	74	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	6,150	923	7,073	7,073	-	-	-	-	-	-	-	-	-	191,919
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	16,162	2,424	18,586	18,586	-	-	-	-	-	-	-	-	-	230,606
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	25,689	3,853	29,543	29,543	-	-	-	-	-	-	-	-	-	429,351
2a.4	Subtotal Period 2a Period-Dependent Costs	88	5,780	19	2	-	279	55,078	9,401	70,647	68,924	1,709	14	-	5,757	-	-	-	135,142	26	851,876
2a.0	TOTAL PERIOD 2a COST	1,998	26,542	10,999	3,461	10,232	33,594	62,136	36,108	185,071	173,377	9,270	2,424	111,456	79,618	3,156	459	-	11,647,780	423,196	858,457
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Auxiliary Building HVAC (insulated)	-	47	2	4	69	5	-	24	151	151	-	-	728	19	-	-	-	31,309	1,123	-
2b.1.1.2	Auxiliary Building HVAC (uninsulated)	-	57	2	5	81	5	-	29	179	179	-	-	846	23	-	-	-	36,394	1,466	-
2b.1.1.3	Batt Rms & Misc Uncontrolled Acc. HVAC	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	91	-
2b.1.1.4	Compressed Air - Instr. Air (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	83	-
2b.1.1.5	Compressed Air - Instrument Air - RCA (I	-	38	2	1	5	14	-	14	74	74	-	-	51	59	-	-	-	7,399	1,174	-
2b.1.1.6	Compressed Air - Instrument Air - RCA (u	-	118	8	4	44	52	-	50	276	276	-	-	462	220	-	-	-	38,507	2,946	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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)																					
2b.1.1.7	Compressed Air - Service Air	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	886	-
2b.1.1.8	Compressed Air - Service Air - RCA	-	122	8	3	36	50	-	50	270	270	-	-	381	216	-	-	-	34,804	3,257	-
2b.1.1.9	Compressed Air - instr. Air(uninsulated)	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,267	-
2b.1.1.10	Containment Hatches	-	15	1	1	9	5	-	6	36	36	-	-	91	19	-	-	-	5,453	411	-
2b.1.1.11	Containment Hydrogen Purge HVAC	-	50	4	4	57	24	-	28	167	167	-	-	598	103	-	-	-	33,522	1,445	-
2b.1.1.12	Containment Spray	-	338	74	98	1,416	432	-	427	2,785	2,785	-	-	14,839	1,849	-	-	-	768,251	9,562	-
2b.1.1.13	Containment Ventilation HVAC (uninsul)	-	27	2	4	64	4	-	18	119	119	-	-	668	18	-	-	-	28,729	791	-
2b.1.1.14	Containment Ventilation HVAC(insulated)	-	186	32	41	589	196	-	193	1,238	1,238	-	-	6,171	839	-	-	-	325,884	5,211	-
2b.1.1.15	Control Room HVAC	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	1,144	-
2b.1.1.16	Demineralized & RCS Makeup Water	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	3,662	-
2b.1.1.17	Demineralized & RCS Makeup Water - RCA	-	377	25	14	160	171	-	165	912	912	-	-	1,675	729	-	-	-	133,368	9,434	-
2b.1.1.18	Diesel Gen & Auxiliaries (insulated)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	185	-
2b.1.1.19	Diesel Gen & Auxiliaries (uninsulated)	-	62	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	2,314	-
2b.1.1.20	Diesel Generator Fuel Oil	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	365	-
2b.1.1.21	Diesel Room HVAC	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	117	-
2b.1.1.22	Electrical - Clean	-	1,554	-	-	-	-	-	233	1,787	-	-	1,787	-	-	-	-	-	-	56,765	-
2b.1.1.23	Electrical - Contaminated	-	268	7	17	262	17	-	114	685	685	-	-	2,749	73	-	-	-	118,221	7,346	-
2b.1.1.24	Electrical - RCA	-	2,405	64	148	2,344	153	-	1,020	6,133	6,133	-	-	24,556	653	-	-	-	1,055,864	65,899	-
2b.1.1.25	Fire Protection	-	397	-	-	-	-	-	60	457	-	-	457	-	-	-	-	-	-	14,858	-
2b.1.1.26	Leak Rate Test	-	4	0	0	3	2	-	2	12	12	-	-	31	8	-	-	-	1,996	121	-
2b.1.1.27	Misc Plant HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	72	-
2b.1.1.28	Misc Plant HVAC (uninsulated)	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	955	-
2b.1.1.29	Miscellaneous Equipment	-	6	0	1	9	1	-	3	20	20	-	-	94	6	-	-	-	4,320	176	-
2b.1.1.30	Office & Service HVAC	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	84	-
2b.1.1.31	Potable Water	-	52	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,892	-
2b.1.1.32	Primary Plant HVAC (insulated)	-	48	2	5	72	5	-	25	157	157	-	-	756	20	-	-	-	32,492	1,166	-
2b.1.1.33	Primary Plant HVAC (uninsulated)	-	87	5	10	166	11	-	51	331	331	-	-	1,740	46	-	-	-	74,811	2,402	-
2b.1.1.34	Radiation Monitoring	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	102	-
2b.1.1.35	Safeguards Building HVAC (insulated)	-	15	1	1	22	1	-	8	48	48	-	-	231	6	-	-	-	9,920	356	-
2b.1.1.36	Safeguards Building HVAC (uninsulated)	-	40	1	3	52	3	-	19	119	119	-	-	542	14	-	-	-	23,318	1,154	-
2b.1.1.37	Service Water	-	49	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,882	-
2b.1.1.38	Service Water - RCA	-	187	32	37	516	215	-	187	1,173	1,173	-	-	5,402	919	-	-	-	301,826	5,301	-
2b.1.1.39	Turbine Building HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	92	-
2b.1.1.40	Turbine Building HVAC (uninsulated)	-	22	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	840	-
2b.1.1.41	UPS HVAC	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
2b.1.1.42	Vents & Drains	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	1,092	-
2b.1.1.43	Vents & Drains - RCA	197	407	30	12	101	223	-	276	1,245	1,245	-	-	1,053	954	-	-	-	128,267	15,702	-
2b.1.1.44	Waste Management (insulated)	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	399	-
2b.1.1.45	Waste Management (uninsulated)	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	4,043	-
2b.1.1.46	Waste Processing Gas (uninsulated)	-	81	7	13	206	19	-	58	383	383	-	-	2,155	100	-	-	-	94,792	2,598	-
2b.1.1.47	Waste Processing Liquid (insulated)	115	256	18	6	37	131	-	163	725	725	-	-	387	559	-	-	-	65,799	10,216	-
2b.1.1.48	Waste Processing Liquid (uninsulated)	257	328	60	27	271	408	-	363	1,713	1,713	-	-	2,838	2,201	-	-	-	271,618	17,383	-
2b.1.1.49	Waste Processing Solid	5	19	4	3	30	35	-	21	118	118	-	-	313	153	-	-	-	26,256	665	-
2b.1.1.50	Water Treatment (insulated)	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,780	-
2b.1.1.51	Water Treatment (uninsulated)	-	490	-	-	-	-	-	73	563	-	-	563	-	-	-	-	-	-	18,716	-
2b.1.1	Totals	574	8,587	388	462	6,619	2,183	-	3,774	22,588	19,067	-	3,520	69,360	9,808	-	-	-	3,653,120	281,030	-
2b.1.2	Scaffolding in support of decommissioning	-	1,322	38	11	174	24	-	368	1,938	1,938	-	-	1,641	102	-	-	-	82,994	50,323	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,045	663	162	63	293	986	-	1,004	4,217	4,217	-	-	3,072	7,255	-	-	-	814,888	49,489	-
2b.1.3.2	Auxiliary	712	373	116	45	159	295	-	565	2,266	2,266	-	-	1,670	5,155	-	-	-	580,594	29,277	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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
Decontamination of Site Buildings (continued)																					
2b.1.3.3	Radwaste Warehouse	232	25	6	2	-	15	-	127	407	407	-	-	-	270	-	-	-	26,964	7,504	-
2b.1.3.4	Safeguard	138	67	17	8	61	42	-	108	441	441	-	-	644	705	-	-	-	95,457	5,679	-
2b.1.3	Totals	2,127	1,127	301	118	514	1,338	-	1,805	7,330	7,330	-	-	5,386	13,385	-	-	-	1,517,903	91,949	-
2b.1	Subtotal Period 2b Activity Costs	2,701	11,037	727	591	7,307	3,545	-	5,947	31,855	28,335	-	3,520	76,387	23,296	-	-	-	5,254,016	423,302	-
Period 2b Collateral Costs																					
2b.3.1	Process liquid waste	230	-	130	360	-	641	-	342	1,704	1,704	-	-	-	1,884	-	-	-	128,989	367	-
2b.3.2	Small tool allowance	-	244	-	-	-	-	-	37	281	281	-	-	-	-	-	-	-	-	-	-
2b.3.3	*Spent Fuel Capital and Transfer*	-	-	-	-	-	-	8,115	1,217	9,332	-	9,332	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	230	244	130	360	-	641	8,115	1,596	11,317	1,985	9,332	-	-	1,884	-	-	-	128,989	367	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	1,630	-	-	-	-	-	-	407	2,037	2,037	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	953	95	1,048	1,048	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	229	23	252	252	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	3,060	-	-	-	-	-	765	3,825	3,825	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,471	-	-	-	-	-	821	6,291	6,291	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	19	2	-	279	-	72	373	373	-	-	-	5,768	-	-	-	115,351	26	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,304	346	2,650	2,650	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,177	118	1,295	1,295	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	572	57	629	-	629	-	-	-	-	-	-	-	-	-
2b.4.10	Decommissioning Staff Severance	-	-	-	-	-	-	245	37	282	282	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,938	291	2,229	-	2,229	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	487	73	560	560	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	112	17	129	-	129	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	10,748	1,612	12,360	12,360	-	-	-	-	-	-	-	-	-	335,406
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	27,042	4,056	31,098	31,098	-	-	-	-	-	-	-	-	-	387,109
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	43,189	6,478	49,667	49,667	-	-	-	-	-	-	-	-	-	718,537
2b.4	Subtotal Period 2b Period-Dependent Costs	1,630	8,530	19	2	-	279	88,996	15,268	114,725	111,739	2,986	-	-	5,768	-	-	-	115,351	26	1,441,051
2b.0	TOTAL PERIOD 2b COST	4,561	19,811	877	953	7,307	4,465	97,111	22,811	157,898	142,058	12,319	3,520	76,387	30,948	-	-	-	5,498,356	423,696	1,441,051
PERIOD 2c - Decontamination Following Wet Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Remove spent fuel racks	124	11	70	6	-	257	-	137	607	607	-	-	-	1,098	-	-	-	98,510	428	-
Disposal of Plant Systems																					
2c.1.2.1	Electrical - Contaminated FHB	-	62	1	3	52	3	-	25	147	147	-	-	546	15	-	-	-	23,478	1,671	-
2c.1.2.2	Electrical - RCA FHB	-	411	14	31	491	32	-	190	1,169	1,169	-	-	5,146	137	-	-	-	221,262	10,133	-
2c.1.2.3	Fire Protection - RCA	-	703	57	46	598	389	-	375	2,169	2,169	-	-	6,266	1,662	-	-	-	403,518	18,261	-
2c.1.2.4	Fuel Building HVAC (insulated)	-	21	1	2	31	2	-	11	68	68	-	-	329	9	-	-	-	14,155	508	-
2c.1.2.5	Fuel Building HVAC (uninsulated)	-	26	1	2	37	2	-	13	82	82	-	-	385	10	-	-	-	16,560	677	-
2c.1.2.6	Fuel Handling	-	5	0	0	6	2	-	3	17	17	-	-	65	10	-	-	-	3,557	150	-
2c.1.2.7	Sewage Treatment	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	678	-
2c.1.2.8	Spent Fuel Pool Cooling & Cleanup	-	773	100	47	444	779	-	472	2,615	2,615	-	-	4,652	3,334	-	-	-	487,492	22,005	-
2c.1.2	Totals	-	2,021	175	132	1,660	1,211	-	1,092	6,290	6,269	-	21	17,390	5,177	-	-	-	1,170,023	54,083	-
Decontamination of Site Buildings																					
2c.1.3.1	Fuel	683	751	40	30	374	98	-	618	2,594	2,594	-	-	3,919	1,424	-	-	-	299,006	43,624	-
2c.1.3	Totals	683	751	40	30	374	98	-	618	2,594	2,594	-	-	3,919	1,424	-	-	-	299,006	43,624	-

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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
2c.1.4	Scaffolding in support of decommissioning	-	264	8	2	35	5	-	74	388	388	-	-	328	20	-	-	-	16,599	10,065	-
2c.1	Subtotal Period 2c Activity Costs	808	3,047	293	171	2,068	1,570	-	1,921	9,879	9,857	-	21	21,637	7,719	-	-	-	1,584,137	108,199	-
Period 2c Additional Costs																					
2c.2.1	License Termination Survey Planning	-	-	-	-	-	-	655	197	852	852	-	-	-	-	-	-	-	-	6,240	-
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	655	197	852	852	-	-	-	-	-	-	-	-	6,240	-
Period 2c Collateral Costs																					
2c.3.1	Process liquid waste	100	-	48	131	-	206	-	126	611	611	-	-	-	689	-	-	-	41,360	134	-
2c.3.2	Small tool allowance	-	67	-	-	-	-	-	10	77	77	-	-	-	-	-	-	-	-	-	-
2c.3.3	Decommissioning Equipment Disposition	-	-	140	50	634	87	-	138	1,050	1,050	-	-	6,000	373	-	-	-	303,507	88	-
2c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	404	61	465	-	465	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	100	67	188	181	634	293	404	335	2,203	1,738	465	-	6,000	1,063	-	-	-	344,867	223	-
Period 2c Period-Dependent Costs																					
2c.4.1	Decon supplies	281	-	-	-	-	-	-	70	351	351	-	-	-	-	-	-	-	-	-	-
2c.4.2	Insurance	-	-	-	-	-	-	309	31	340	340	-	-	-	-	-	-	-	-	-	-
2c.4.3	Property taxes	-	-	-	-	-	-	74	7	82	82	-	-	-	-	-	-	-	-	-	-
2c.4.4	Health physics supplies	-	841	-	-	-	-	-	210	1,052	1,052	-	-	-	-	-	-	-	-	-	-
2c.4.5	Heavy equipment rental	-	1,774	-	-	-	-	-	266	2,041	2,041	-	-	-	-	-	-	-	-	-	-
2c.4.6	Disposal of DAW generated	-	-	9	1	-	131	-	34	176	176	-	-	-	2,715	-	-	-	54,300	12	-
2c.4.7	Plant energy budget	-	-	-	-	-	-	399	60	458	458	-	-	-	-	-	-	-	-	-	-
2c.4.8	NRC Fees	-	-	-	-	-	-	382	38	420	420	-	-	-	-	-	-	-	-	-	-
2c.4.9	Emergency Planning Fees	-	-	-	-	-	-	185	19	204	-	204	-	-	-	-	-	-	-	-	-
2c.4.10	Decommissioning Staff Severance	-	-	-	-	-	-	1,637	245	1,882	1,882	-	-	-	-	-	-	-	-	-	-
2c.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	316	47	363	363	-	-	-	-	-	-	-	-	-	-
2c.4.12	ISFSI Operating Costs	-	-	-	-	-	-	36	5	42	-	42	-	-	-	-	-	-	-	-	-
2c.4.13	Security Staff Cost	-	-	-	-	-	-	1,927	289	2,216	2,216	-	-	-	-	-	-	-	-	-	57,190
2c.4.14	DOC Staff Cost	-	-	-	-	-	-	5,998	900	6,897	6,897	-	-	-	-	-	-	-	-	-	86,000
2c.4.15	Utility Staff Cost	-	-	-	-	-	-	10,166	1,525	11,691	11,691	-	-	-	-	-	-	-	-	-	164,260
2c.4	Subtotal Period 2c Period-Dependent Costs	281	2,616	9	1	-	131	21,428	3,747	28,213	27,968	246	-	-	2,715	-	-	-	54,300	12	307,450
2c.0	TOTAL PERIOD 2c COST	1,189	5,730	490	353	2,703	1,995	22,488	6,201	41,147	40,415	711	21	27,637	11,497	-	-	-	1,983,304	114,674	307,450
PERIOD 2e - License Termination																					
Period 2e Direct Decommissioning Activities																					
2e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
2e.1.2	Terminate license									a											
2e.1	Subtotal Period 2e Activity Costs	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
Period 2e Additional Costs																					
2e.2.1	License Termination Survey	-	-	-	-	-	-	5,444	1,633	7,077	7,077	-	-	-	-	-	-	-	-	153,525	3,120
2e.2	Subtotal Period 2e Additional Costs	-	-	-	-	-	-	5,444	1,633	7,077	7,077	-	-	-	-	-	-	-	-	153,525	3,120
Period 2e Collateral Costs																					
2e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
2e.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	83	12	95	-	95	-	-	-	-	-	-	-	-	-
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	1,568	235	1,804	1,709	95	-	-	-	-	-	-	-	-	-

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Comanche Peak Nuclear Power Plant, Unit 2
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(thousands of 2009 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 2e Period-Dependent Costs																					
2e.4.1	Insurance	-	-	-	-	-	-	248	25	273	273	-	-	-	-	-	-	-	-	-	-
2e.4.2	Property taxes	-	-	-	-	-	-	68	7	75	75	-	-	-	-	-	-	-	-	-	-
2e.4.3	Health physics supplies	-	668	-	-	-	-	-	167	835	835	-	-	-	-	-	-	-	-	-	-
2e.4.4	Disposal of DAW generated	-	-	1	0	-	12	-	3	16	16	-	-	-	249	-	-	-	4,974	1	-
2e.4.5	Plant energy budget	-	-	-	-	-	-	182	27	209	209	-	-	-	-	-	-	-	-	-	-
2e.4.6	NRC Fees	-	-	-	-	-	-	365	37	402	402	-	-	-	-	-	-	-	-	-	-
2e.4.7	Emergency Planning Fees	-	-	-	-	-	-	169	17	186	-	186	-	-	-	-	-	-	-	-	-
2e.4.8	Decommissioning Staff Severance	-	-	-	-	-	-	2,342	351	2,694	2,694	-	-	-	-	-	-	-	-	-	-
2e.4.9	ISFSI Operating Costs	-	-	-	-	-	-	33	5	38	-	38	-	-	-	-	-	-	-	-	-
2e.4.10	Security Staff Cost	-	-	-	-	-	-	934	140	1,074	1,074	-	-	-	-	-	-	-	-	-	27,893
2e.4.11	DOC Staff Cost	-	-	-	-	-	-	3,225	484	3,709	3,709	-	-	-	-	-	-	-	-	-	46,750
2e.4.12	Utility Staff Cost	-	-	-	-	-	-	3,805	571	4,376	4,376	-	-	-	-	-	-	-	-	-	60,107
2e.4	Subtotal Period 2e Period-Dependent Costs	-	668	1	0	-	12	11,372	1,833	13,887	13,662	224	-	-	249	-	-	-	4,974	1	134,750
2e.0	TOTAL PERIOD 2e COST	-	668	1	0	-	12	18,536	3,747	22,964	22,645	320	-	-	249	-	-	-	4,974	153,526	137,870
PERIOD 2 TOTALS		7,748	52,751	12,368	4,767	20,242	40,066	200,271	68,868	407,080	378,495	22,619	5,966	215,480	122,312	3,156	459	-	19,134,410	1,115,092	2,744,829
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	5,679	-	-	-	-	-	852	6,531	-	-	6,531	-	-	-	-	-	-	79,426	-
3b.1.1.2	Administration	-	96	-	-	-	-	-	14	111	-	-	111	-	-	-	-	-	-	2,092	-
3b.1.1.3	Auxiliary	-	4,249	-	-	-	-	-	637	4,886	-	-	4,886	-	-	-	-	-	-	61,157	-
3b.1.1.4	Chlorination (CW Intake)	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	443	-
3b.1.1.5	Chlorination (SW Intake)	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	141	-
3b.1.1.6	Circ Water Intake	-	1,322	-	-	-	-	-	198	1,520	-	-	1,520	-	-	-	-	-	-	17,143	-
3b.1.1.7	Circ Water Yard Piping	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	36	-
3b.1.1.8	Diesel Generator	-	605	-	-	-	-	-	91	695	-	-	695	-	-	-	-	-	-	8,908	-
3b.1.1.9	Maintenance	-	198	-	-	-	-	-	30	227	-	-	227	-	-	-	-	-	-	4,321	-
3b.1.1.10	Megawatt Support Ctr & Material Staging	-	331	-	-	-	-	-	50	381	-	-	381	-	-	-	-	-	-	7,669	-
3b.1.1.11	Miscellaneous Site Structures	-	8,910	-	-	-	-	-	1,336	10,246	-	-	10,246	-	-	-	-	-	-	174,325	-
3b.1.1.12	Radwaste Warehouse	-	214	-	-	-	-	-	32	246	-	-	246	-	-	-	-	-	-	5,675	-
3b.1.1.13	Safeguard	-	2,051	-	-	-	-	-	308	2,358	-	-	2,358	-	-	-	-	-	-	30,287	-
3b.1.1.14	Service Water Intake Structure	-	521	-	-	-	-	-	78	599	-	-	599	-	-	-	-	-	-	7,175	-
3b.1.1.15	Switchgear	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	2,049	-
3b.1.1.16	Switchyard Relay House	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	451	-
3b.1.1.17	Tanks & Tunnels	-	929	-	-	-	-	-	139	1,068	-	-	1,068	-	-	-	-	-	-	15,724	-
3b.1.1.18	Turbine	-	550	-	-	-	-	-	82	632	-	-	632	-	-	-	-	-	-	11,258	-
3b.1.1.19	Turbine Pedestal	-	1,188	-	-	-	-	-	178	1,366	-	-	1,366	-	-	-	-	-	-	15,907	-
3b.1.1.20	Fuel	-	4,201	-	-	-	-	-	630	4,831	-	-	4,831	-	-	-	-	-	-	59,867	-
3b.1.1	Totals	-	31,213	-	-	-	-	-	4,682	35,895	-	-	35,895	-	-	-	-	-	-	504,053	-
Site Closeout Activities																					
3b.1.2	Backfill Site	-	2,643	-	-	-	-	-	396	3,039	-	-	3,039	-	-	-	-	-	-	6,414	-
3b.1.3	Grade & landscape site	-	477	-	-	-	-	-	72	549	-	-	549	-	-	-	-	-	-	1,292	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	82	12	94	94	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	34,332	-	-	-	-	82	5,162	39,577	94	-	39,482	-	-	-	-	-	-	511,759	668

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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 3b Additional Costs																					
3b.2.1	Concrete Processing	-	1,521	-	-	-	-	6	229	1,757	-	-	1,757	-	-	-	-	-	-	7,139	-
3b.2.2	Circulating Water Cofferdam	-	428	-	-	-	-	-	64	492	-	-	492	-	-	-	-	-	-	3,894	-
3b.2.3	Service Water Cofferdam	-	409	-	-	-	-	-	61	471	-	-	471	-	-	-	-	-	-	3,725	-
3b.2	Subtotal Period 3b Additional Costs	-	2,359	-	-	-	-	6	355	2,720	-	-	2,720	-	-	-	-	-	-	14,758	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	307	-	-	-	-	-	46	353	-	-	353	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	219	33	252	-	252	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	307	-	-	-	-	219	79	605	-	252	353	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	328	33	361	-	361	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	180	18	198	-	198	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,136	-	-	-	-	-	920	7,056	-	-	7,056	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	241	36	277	(0)	55	222	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	250	25	275	-	275	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	448	45	493	-	493	-	-	-	-	-	-	-	-	-
3b.4.7	Decommissioning Staff Severance	-	-	-	-	-	-	1,422	213	1,635	1,635	-	-	-	-	-	-	-	-	-	-
3b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	88	13	101	-	101	-	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	2,362	354	2,716	0	2,227	489	-	-	-	-	-	-	-	70,221
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	7,431	1,115	8,546	-	-	8,546	-	-	-	-	-	-	-	110,240
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	4,448	667	5,115	(0)	1,023	4,092	-	-	-	-	-	-	-	70,221
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,136	-	-	-	-	17,197	3,440	26,773	1,635	4,733	20,405	-	-	-	-	-	-	-	250,682
3b.0	TOTAL PERIOD 3b COST	-	43,134	-	-	-	-	17,505	9,036	69,675	1,730	4,984	62,961	-	-	-	-	-	-	526,517	251,349
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,509	376	2,885	-	2,885	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	2,509	376	2,885	-	2,885	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	3,752	375	4,127	-	4,127	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	2,054	205	2,260	-	2,260	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	2,856	286	3,142	-	3,142	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	5,131	513	5,644	-	5,644	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,003	150	1,153	-	1,153	-	-	-	-	-	-	-	-	-
3c.4.7	Security Staff Cost	-	-	-	-	-	-	22,168	3,325	25,493	-	25,493	-	-	-	-	-	-	-	-	642,523
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	10,170	1,525	11,695	-	11,695	-	-	-	-	-	-	-	-	160,869
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	47,134	6,380	53,515	-	53,515	-	-	-	-	-	-	-	-	803,392
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	49,643	6,757	56,400	-	56,400	-	-	-	-	-	-	-	-	803,392

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	463	-	-	10,837	-	1,672	12,972	12,972	-	-	-	-	-	-	505	104,146	-	-
3d.1.1	Totals	-	-	463	-	-	10,837	-	1,672	12,972	12,972	-	-	-	-	-	-	505	104,146	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	463	-	-	10,837	-	1,672	12,972	12,972	-	-	-	-	-	-	505	104,146	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	6	1	7	-	7	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	3	0	4	-	4	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	9	1	9	-	9	-	-	-	-	-	-	-	-	-
3d.4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.6	Security Staff Cost	-	-	-	-	-	-	37	6	43	-	43	-	-	-	-	-	-	-	-	1,080
3d.4.7	Utility Staff Cost	-	-	-	-	-	-	17	3	20	-	20	-	-	-	-	-	-	-	-	270
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	74	10	85	-	85	-	-	-	-	-	-	-	-	1,350
3d.0	TOTAL PERIOD 3d COST	-	-	463	-	-	10,837	74	1,682	13,056	12,972	85	-	-	-	-	-	505	104,146	-	1,350
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	ISFSI License Termination	-	23	1	8	-	371	696	204	1,304	-	1,304	-	-	1,701	-	-	-	142,522	2,565	1,280
3e.2	Subtotal Period 3e Additional Costs	-	23	1	8	-	371	696	204	1,304	-	1,304	-	-	1,701	-	-	-	142,522	2,565	1,280
Period 3e Collateral Costs																					
3e.3.1	Small tool allowance	-	0	-	-	-	-	-	0	0	-	0	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	0	-	-	-	-	-	0	0	-	0	-	-	-	-	-	-	-	-	-
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	54	5	59	-	59	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	30	3	33	-	33	-	-	-	-	-	-	-	-	-
3e.4.3	Heavy equipment rental	-	274	-	-	-	-	-	41	315	-	315	-	-	-	-	-	-	-	-	-
3e.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3e.4.5	ISFSI Operating Costs	-	-	-	-	-	-	14	2	17	-	17	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	85	13	98	-	98	-	-	-	-	-	-	-	-	2,489
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	119	18	137	-	137	-	-	-	-	-	-	-	-	1,886
3e.4	Subtotal Period 3e Period-Dependent Costs	-	274	-	-	-	-	303	82	659	-	659	-	-	-	-	-	-	-	-	4,375
3e.0	TOTAL PERIOD 3e COST	-	297	1	8	-	371	999	287	1,964	-	1,964	-	-	1,701	-	-	-	142,522	2,565	5,655
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	ISFSI Demolition and Site Restoration	-	724	-	-	-	-	25	112	860	-	860	-	-	-	-	-	-	-	14,350	80
3f.2	Subtotal Period 3f Additional Costs	-	724	-	-	-	-	25	112	860	-	860	-	-	-	-	-	-	-	14,350	80

Table C-2
Comanche Peak Nuclear Power Plant, Unit 2
DECON Decommissioning Cost Estimate
(thousands of 2009 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 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	8	-	-	-	-	-	1	10	-	10	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	8	-	-	-	-	-	1	10	-	10	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	15	1	16	-	16	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	106	-	-	-	-	-	16	122	-	122	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.5	Security Staff Cost	-	-	-	-	-	-	43	6	49	-	49	-	-	-	-	-	-	-	-	1,245
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	50	7	57	-	57	-	-	-	-	-	-	-	-	771
3f.4	Subtotal Period 3f Period-Dependent Costs	-	106	-	-	-	-	107	31	244	-	244	-	-	-	-	-	-	-	-	2,016
3f.0	TOTAL PERIOD 3f COST	-	838	-	-	-	-	132	145	1,114	-	1,114	-	-	-	-	-	-	-	14,350	2,096
PERIOD 3 TOTALS		-	44,270	463	8	-	11,208	68,353	17,936	142,208	14,701	64,547	62,961	-	1,701	-	-	505	246,668	543,432	1,063,842
TOTAL COST TO DECOMMISSION		10,922	99,538	12,917	5,009	20,242	54,815	354,886	101,951	660,280	490,477	100,224	69,579	215,480	125,180	3,986	459	505	19,511,390	1,671,660	4,799,626

TOTAL COST TO DECOMMISSION WITH 18.26% CONTINGENCY:	$660,280	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 74.28% OR:	$490,476	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 15.18% OR:	$100,224	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 10.54% OR:	$69,579	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	129,625	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	94,931	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,671,660	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

Tables

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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	-	-	-	-	-	-	328	98	426	426	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	246	37	283	283	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	*End product description*	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	185	28	212	212	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	381	57	439	439	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	615	92	708	708	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	605	91	696	696	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	513	77	590	590	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	384	58	442	442	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	246	37	283	283	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	246	37	283	283	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	1,994	299	2,294	2,294	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	146	22	167	167	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	293	44	337	337	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	12	2	14	14	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	4,744	761	5,505	5,505	-	-	-	-	-	-	-	-	-	35,890
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	593	89	682	-	682	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	593	89	682	-	682	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,005	101	1,106	1,106	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	90	9	99	99	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	404	-	-	-	-	-	101	505	505	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	514	-	-	-	-	-	77	591	591	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	0	-	24	-	6	32	32	-	-	-	493	-	-	-	9,854	2	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,208	181	1,390	1,390	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	738	74	812	812	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	445	44	489	-	489	-	-	-	-	-	-	-	-	-

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 Period-Dependent Costs (continued)																					
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	762	114	877	-	877	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	370	56	426	426	-	-	-	-	-	-	-	-	-	12,264
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	24,777	3,717	28,493	28,493	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	918	2	0	-	24	29,440	4,486	34,870	33,453	1,416	-	-	493	-	-	-	9,854	2	435,664
1a.0	TOTAL PERIOD 1a COST	-	918	2	0	-	24	34,778	5,336	41,057	38,959	2,099	-	-	493	-	-	-	9,854	2	471,554
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,033	-	-	-	-	-	-	517	1,550	1,550	-	-	-	-	-	-	-	-	30,861	-
1b.1.1.2	Safeguard	132	-	-	-	-	-	-	66	198	198	-	-	-	-	-	-	-	-	3,960	-
1b.1.1	Totals	1,165	-	-	-	-	-	-	583	1,748	1,748	-	-	-	-	-	-	-	-	34,821	-
1b.1	Subtotal Period 1b Activity Costs	1,165	-	-	-	-	-	-	583	1,748	1,748	-	-	-	-	-	-	-	-	34,821	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	991	-	-	-	-	-	-	149	1,140	1,140	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	177	-	83	229	-	359	-	221	1,068	1,068	-	-	-	1,203	-	-	-	72,196	235	-
1b.3.3	Small tool allowance	-	21	-	-	-	-	-	3	24	24	-	-	-	-	-	-	-	-	-	-
1b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	136	20	156	-	156	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,168	21	83	229	-	359	136	393	2,388	2,232	156	-	-	1,203	-	-	-	72,196	235	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	685	-	-	-	-	-	-	171	857	857	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	253	25	279	279	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	23	2	25	25	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	269	-	-	-	-	-	67	336	336	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	130	-	-	-	-	-	19	149	149	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	2	0	-	24	-	6	32	32	-	-	-	498	-	-	-	9,951	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	305	46	350	350	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	186	19	205	205	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	112	11	123	-	123	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	192	29	221	-	221	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	93	14	107	107	-	-	-	-	-	-	-	-	-	3,091
1b.4.13	Utility Staff Cost	-	-	-	-	-	-	6,245	937	7,182	7,182	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	685	399	2	0	-	24	7,420	1,349	9,879	9,522	357	-	-	498	-	-	-	9,951	2	109,811
1b.0	TOTAL PERIOD 1b COST	3,019	420	85	229	-	383	17,246	3,778	25,159	24,646	513	-	-	1,701	-	-	-	82,147	35,058	109,811

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	348	-	-	-	-	-	52	400	400	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	22	-	-	-	-	-	3	26	26	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	16,711	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	72	11	83	83	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	370	-	-	-	-	805	286	1,461	1,461	-	-	-	-	-	-	-	-	20,411	583
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	219	-	103	283	-	444	-	273	1,323	1,323	-	-	-	1,490	-	-	-	89,428	291	-
1c.3.2	Small tool allowance	-	2	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1c.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	137	21	158	-	158	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	219	2	103	283	-	444	137	294	1,484	1,326	158	-	-	1,490	-	-	-	89,428	291	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	256	26	282	282	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	23	2	25	25	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	202	-	-	-	-	-	50	252	252	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	131	-	-	-	-	-	20	151	151	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	6	-	2	8	8	-	-	-	126	-	-	-	2,511	1	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	308	46	354	354	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	188	19	207	207	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	113	11	125	-	125	-	-	-	-	-	-	-	-	-
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	194	29	223	-	223	-	-	-	-	-	-	-	-	-
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1c.4.11	Security Staff Cost	-	-	-	-	-	-	94	14	108	108	-	-	-		-	-	-	-	-	3,125
1c.4.12	Utility Staff Cost	-	-	-	-	-	-	6,313	947	7,260	7,260	-	-	-	-	-	-	-	-	-	107,880
1c.4	Subtotal Period 1c Period-Dependent Costs	-	333	0	0	-	6	7,501	1,168	9,008	8,647	361	-	-	126	-	-	-	2,511	1	111,005
1c.0	TOTAL PERIOD 1c COST	219	705	104	284	-	451	8,443	1,748	11,953	11,434	519	-	-	1,616	-	-	-	91,939	20,702	111,588
PERIOD 1 TOTALS		3,238	2,042	190	513	-	857	60,467	10,862	78,169	75,038	3,131	-	-	3,810	-	-	-	183,940	55,763	692,953
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	-	-	-	-	-	-	2	0	2	2	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	502	125	627	627	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	503	126	629	629	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	14,844	2,227	17,070	-	17,070	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	14,844	2,227	17,070	-	17,070	-	-	-	-	-	-	-	-	-

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,496	150	1,645	1,384	262	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	359	36	395	395	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	261	-	-	-	-	-	65	326	326	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	3	0	-	50	-	13	66	66	-	-	-	1,027	-	-	-	20,536	5	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	965	145	1,109	555	555	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	774	77	851	851	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	898	90	987	-	987	-	-	-	-	-	-	-	-	-
2a.4.8	Decommissioning Staff Severance	-	-	-	-	-	-	7,999	1,200	9,199	-	9,199	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	3,043	456	3,500	-	3,500	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	175	26	202	-	202	-	-	-	-	-	-	-	-	-
2a.4.11	Utility Staff Cost	-	-	-	-	-	-	3,517	528	4,045	3,591	454	-	-	-	-	-	-	-	-	62,443
2a.4	Subtotal Period 2a Period-Dependent Costs	-	261	3	0	-	50	19,226	2,786	22,326	7,168	15,158	-	-	1,027	-	-	-	20,536	5	62,443
2a.0	TOTAL PERIOD 2a COST	-	261	3	0	-	50	34,573	5,138	40,025	7,797	32,228	-	-	1,027	-	-	-	20,536	5	62,443
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	-	-	-	-	-	-	13	2	15	15	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	3,698	925	4,623	4,623	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	3,711	926	4,637	4,637	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,365	2,005	15,370	-	15,370	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	13,365	2,005	15,370	-	15,370	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	9,675	968	10,643	10,198	445	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	2,649	265	2,914	2,914	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,984	-	-	-	-	-	496	2,481	2,481	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	26	3	-	371	-	96	495	495	-	-	-	7,657	-	-	-	153,138	35	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	3,555	533	4,088	4,088	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	5,703	570	6,273	6,273	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	6,615	662	7,277	-	7,277	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,293	194	1,487	-	1,487	-	-	-	-	-	-	-	-	-
2b.4.9	Security Staff Cost	-	-	-	-	-	-	28,582	4,287	32,870	20,076	12,794	-	-	-	-	-	-	-	-	828,437
2b.4.10	Utility Staff Cost	-	-	-	-	-	-	37,050	5,557	42,607	26,466	16,141	-	-	-	-	-	-	-	-	613,657
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,984	26	3	-	371	95,123	13,628	111,135	72,990	38,144	-	-	7,657	-	-	-	153,138	35	1,442,094
2b.0	TOTAL PERIOD 2b COST	-	1,984	26	3	-	371	112,199	16,559	131,142	77,628	53,514	-	-	7,657	-	-	-	153,138	35	1,442,094
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	-	-	-	-	-	-	7	1	9	9	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	2,187	547	2,734	2,734	-	-	-	-	-	-	-	-	-	-

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	2,194	548	2,742	2,742	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	5,482	548	6,030	6,030	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	1,566	157	1,723	1,723	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	1,122	-	-	-	-	-	280	1,402	1,402	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	15	2	-	216	-	56	288	288	-	-	-	4,452	-	-	-	89,034	20	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	2,102	315	2,418	2,418	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	3,015	301	3,316	3,316	-	-	-	-	-	-	-	-	-	-
2c.4.7	Security Staff Cost	-	-	-	-	-	-	10,323	1,548	11,871	11,871	-	-	-	-	-	-	-	-	-	272,143
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	13,608	2,041	15,649	15,649	-	-	-	-	-	-	-	-	-	231,503
2c.4	Subtotal Period 2c Period-Dependent Costs	-	1,122	15	2	-	216	36,095	5,247	42,696	42,696	-	-	-	4,452	-	-	-	89,034	20	503,646
2c.0	TOTAL PERIOD 2c COST	-	1,122	15	2	-	216	38,290	5,795	45,439	45,439	-	-	-	4,452	-	-	-	89,034	20	503,646
PERIOD 2 TOTALS		-	3,367	44	5	-	636	185,061	27,492	216,606	130,863	85,743	-	-	13,135	-	-	-	262,708	60	2,008,183
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	923	138	1,061	1,061	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	381	57	439	439	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	615	92	708	708	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	504	76	580	580	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	907	136	1,043	939	-	104	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	513	77	590	531	-	59	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	874	131	1,005	1,005	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	800	120	920	920	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	384	58	442	442	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	197	30	226	113	-	113	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	49	7	57	-	-	57	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	49	7	57	-	-	57	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	384	58	442	221	-	221	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	111	17	127	64	-	64	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	4,895	734	5,629	4,955	-	674	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	295	44	340	340	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	172	26	198	198	-	-	-	-	-	-	-	-	-	1,400
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	151	23	174	174	-	-	-	-	-	-	-	-	-	1,230

Table D-1
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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 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
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	13,947	2,092	16,039	15,365	-	674	-	-	-	-	-	-	-	72,703
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	315	32	347	347	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	90	9	99	99	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	339	-	-	-	-	-	85	423	423	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	514	-	-	-	-	-	77	591	591	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	1	0	-	19	-	5	26	26	-	-	-	398	-	-	-	7,951	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,208	181	1,390	1,390	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	245	25	270	270	-	-	-	-	-	-	-	-	-	-
3a.4.8	Security Staff Cost	-	-	-	-	-	-	2,211	332	2,542	2,542	-	-	-	-	-	-	-	-	-	65,179
3a.4.9	Utility Staff Cost	-	-	-	-	-	-	15,376	2,306	17,682	17,682	-	-	-	-	-	-	-	-	-	258,629
3a.4	Subtotal Period 3a Period-Dependent Costs	-	853	1	0	-	19	19,445	3,051	23,370	23,370	-	-	-	398	-	-	-	7,951	2	323,807
3a.0	TOTAL PERIOD 3a COST	-	853	1	0	-	19	33,392	5,143	39,409	38,734	-	674	-	398	-	-	-	7,951	2	396,510
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	582	87	670	603	-	67	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor Internals	-	-	-	-	-	-	308	46	354	354	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	166	25	191	48	-	143	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	123	18	142	142	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	447	67	514	514	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	148	22	170	85	-	85	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	55	8	64	64	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	148	22	170	170	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	566	85	651	651	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	123	18	142	71	-	71	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	192	29	221	-	-	221	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	192	29	221	-	-	221	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	336	50	386	348	-	39	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	336	50	386	348	-	39	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,968	595	4,563	3,678	-	885	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,968	595	4,563	3,678	-	885	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	4,324	1,297	5,621	5,621	-	-	-	-	-	-	-	-	27,670	10,132
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	4,324	1,297	5,621	5,621	-	-	-	-	-	-	-	-	27,670	10,132
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	991	-	-	-	-	-	-	149	1,140	1,140	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	991	1,100	-	-	-	-	1,486	537	4,113	4,113	-	-	-	-	-	-	-	-	-	-

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR 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 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 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	31	-	-	-	-	-	-	8	38	38	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	190	19	209	209	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	46	5	50	50	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	195	-	-	-	-	-	49	244	244	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	261	-	-	-	-	-	39	300	300	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	1	0	-	11	-	3	15	15	-	-	-	236	-	-	-	4,714	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	612	92	704	704	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	124	12	137	137	-	-	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	1,121	168	1,289	1,289	-	-	-	-	-	-	-	-	-	33,036
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	4,311	647	4,958	4,958	-	-	-	-	-	-	-	-	-	59,200
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	7,793	1,169	8,962	8,962	-	-	-	-	-	-	-	-	-	131,086
3b.4	Subtotal Period 3b Period-Dependent Costs	31	456	1	0	-	11	14,197	2,210	16,906	16,906	-	-	-	236	-	-	-	4,714	1	223,321
3b.0	TOTAL PERIOD 3b COST	1,022	1,556	1	0	-	11	23,975	4,639	31,203	30,319	-	885	-	236	-	-	-	4,714	27,671	265,696
PERIOD 3 TOTALS		1,022	2,409	2	0	-	31	57,366	9,782	70,612	69,053	-	1,559	-	633	-	-	-	12,665	27,673	662,206
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	16	78	16	7	94	114	-	73	398	398	-	-	361	361	-	-	-	83,745	2,449	-
4a.1.1.2	Pressorizer Relief Tank	4	15	7	3	43	48	-	25	145	145	-	-	165	165	-	-	-	36,553	596	-
4a.1.1.3	Reactor Coolant Pumps & Motors	17	53	46	92	-	2,030	-	548	2,786	2,786	-	-	-	7,231	-	-	-	792,800	2,801	80
4a.1.1.4	Pressurizer	6	32	338	73	-	967	-	297	1,713	1,713	-	-	-	3,445	-	-	-	251,471	1,512	750
4a.1.1.5	Steam Generators	51	3,087	1,260	1,245	2,946	6,379	-	3,146	18,113	18,113	-	-	40,067	23,397	-	-	-	3,329,768	20,508	1,500
4a.1.1.6	Retired Steam Generator Units	-	1,455	1,260	1,527	2,946	6,379	891	2,889	17,346	17,346	-	-	40,067	22,721	-	-	-	3,144,067	22,467	14,833
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	21	66	255	15	127	149	-	111	742	742	-	-	1,458	3,044	-	-	-	111,119	2,342	-
4a.1.1.8	Reactor Vessel Internals	31	1,778	3,690	249	-	3,734	169	4,226	13,878	13,878	-	-	-	2,312	376	470	-	326,129	17,867	847
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	10,837	-	1,626	12,462	12,462	-	-	-	-	-	-	505	104,146	-	-
4a.1.1.10	Reactor Vessel	-	3,747	975	108	-	3,877	169	5,045	13,922	13,922	-	-	-	6,672	2,955	-	-	985,324	17,867	847
4a.1.1	Totals	145	10,310	7,846	3,319	6,155	34,514	1,230	17,986	81,505	81,505	-	-	82,118	69,347	3,330	470	505	9,165,121	88,408	18,857
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	221	227	55	794	-	-	205	1,502	1,502	-	-	3,973	-	-	-	-	337,743	7,290	-
4a.1.3	Main Condensers	-	693	156	46	752	-	-	309	1,956	1,956	-	-	7,111	-	-	-	-	320,000	22,781	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,002	-	-	-	-	-	150	1,152	1,152	-	-	-	-	-	-	-	-	13,996	-
4a.1.4.2	Safeguard	-	108	-	-	-	-	-	16	124	124	-	-	-	-	-	-	-	-	1,588	-
4a.1.4	*Totals*	-	1,109	-	-	-	-	-	166	1,276	1,276	-	-	-	-	-	-	-	-	15,584	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwater (insulated)	-	504	19	54	872	-	-	267	1,716	1,716	-	-	9,141	-	-	-	-	371,224	13,548	-
4a.1.5.2	Auxiliary Steam	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	395	-
4a.1.5.3	Boron Recycle (insulated)	-	4	0	0	1	2	-	2	10	10	-	-	15	7	-	-	-	1,251	117	-
4a.1.5.4	Boron Recycle (uninsulated)	-	26	1	1	10	10	-	11	58	58	-	-	101	42	-	-	-	7,900	680	-
4a.1.5.5	Boron Thermal Regeneration (insulated)	-	67	4	2	26	27	-	28	154	154	-	-	271	114	-	-	-	21,254	1,819	-
4a.1.5.6	Boron Thermal Regeneration (uninsulated)	-	169	11	7	81	73	-	75	415	415	-	-	853	312	-	-	-	62,584	4,567	-
4a.1.5.7	Chemical & Volume Control (insulated)	-	146	8	4	50	56	-	60	325	325	-	-	524	240	-	-	-	42,797	3,936	-
4a.1.5.8	Chemical & Volume Control (uninsulated)	-	295	18	12	150	120	-	130	726	726	-	-	1,571	516	-	-	-	109,905	8,027	-

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Disposal of Plant Systems (continued)																					
4a.1.5.9	Chemical Feed	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	218	-
4a.1.5.10	Chemical Feed - RCA	-	7	0	0	2	-	-	2	12	12	-	-	20	-	-	-	-	821	252	-
4a.1.5.11	Chilled Water - Safety	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	139	-
4a.1.5.12	Chilled Water - Safety - RCA	-	79	1	3	56	-	-	29	168	168	-	-	587	-	-	-	-	23,832	1,973	-
4a.1.5.13	Circulating Water	-	150	-	-	-	-	-	22	172	-	-	172	-	-	-	-	-	-	5,720	-
4a.1.5.14	Component Cooling Water	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	709	-
4a.1.5.15	Component Cooling Water - RCA	-	834	49	138	2,243	-	-	570	3,834	3,834	-	-	23,501	-	-	-	-	954,386	22,464	-
4a.1.5.16	Condensate (Insulated)	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	4,155	-
4a.1.5.17	Condensate (uninsulated)	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	3,200	-
4a.1.5.18	Condensate Polishing	-	81	-	-	-	-	-	12	93	-	-	93	-	-	-	-	-	-	3,095	-
4a.1.5.19	Condenser Vacuum & Water Box Priming	-	54	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	2,054	-
4a.1.5.20	Extraction Steam	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	2,335	-
4a.1.5.21	Feedwater	-	185	-	-	-	-	-	28	213	-	-	213	-	-	-	-	-	-	7,102	-
4a.1.5.22	Feedwater - RCA	-	50	4	10	162	-	-	39	264	264	-	-	1,696	-	-	-	-	68,878	1,398	-
4a.1.5.23	Generator & Exciter	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
4a.1.5.24	Generator Gas Cooling	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	247	-
4a.1.5.25	Generator Primary Water	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	2,003	-
4a.1.5.26	Generator Seal Oil	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	232	-
4a.1.5.27	Hydrogen Gas	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	53	-
4a.1.5.28	Main Steam Reheat & Steam Dump	-	30	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	1,105	-
4a.1.5.29	Main Steam Reheat & Steam Dump - RCA	-	389	17	47	760	-	-	220	1,432	1,432	-	-	7,963	-	-	-	-	323,380	10,344	-
4a.1.5.30	Main Turbine Lube Oil	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,390	-
4a.1.5.31	Main Turbine Oil Purification	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	2,778	-
4a.1.5.32	Nitrogen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	50	-
4a.1.5.33	Post Accident Sampling	-	7	0	0	2	-	-	2	11	11	-	-	20	-	-	-	-	811	221	-
4a.1.5.34	Process Sampling (uninsulated)	-	7	1	1	24	-	-	6	39	39	-	-	247	-	-	-	-	*10,030*	236	-
4a.1.5.35	Reactor Coolant	-	93	7	3	30	51	-	42	225	225	-	-	314	217	-	-	-	32,214	2,507	-
4a.1.5.36	Residual Heat Removal	-	185	33	43	623	195	-	198	1,277	1,277	-	-	6,524	832	-	-	-	339,502	5,523	-
4a.1.5.37	Safety Injection (Insulated)	-	116	4	12	191	-	-	60	383	383	-	-	2,002	-	-	-	-	81,294	3,257	-
4a.1.5.38	Safety Injection (uninsulated)	-	221	15	42	689	-	-	166	1,134	1,134	-	-	7,217	-	-	-	-	293,092	6,497	-
4a.1.5.39	Secondary Plant Sampling	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	1,040	-
4a.1.5.40	Steam Generator Blowdown & Cleanup	-	91	-	-	-	-	-	14	105	-	-	105	-	-	-	-	-	-	3,483	-
4a.1.5.41	Turbine Electrohydr Cntrl (Insulated)	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	663	-
4a.1.5.42	Turbine Electrohydr Cntrl (uninsulated)	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	416	-
4a.1.5.43	Turbine Gland Steam & Drains	-	35	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	1,357	-
4a.1.5.44	Turbine Heater Drains	-	327	-	-	-	-	-	49	376	-	-	376	-	-	-	-	-	-	12,600	-
4a.1.5.45	Turbine Plant Cooling (insulated)	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	533	-
4a.1.5.46	Turbine Plant Cooling (uninsulated)	-	117	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	4,495	-
4a.1.5.47	Turbines (High - Low) (insulated)	-	28	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	1,105	-
4a.1.5.48	Turbines (High - Low) (uninsulated)	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	1,703	-
4a.1.5.49	Vent Chilled Water - Non Safety	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	500	-
4a.1.5.50	Vent Chilled Water - Non Safety- RCA	-	117	2	7	110	-	-	47	283	283	-	-	1,148	-	-	-	-	46,634	2,941	-
4a.1.5.51	Westinghouse Process Instruments	-	3	0	0	2	-	-	1	5	5	-	-	19	-	-	-	-	760	85	-
4a.1.5	Totals	-	5,020	194	387	6,082	533	-	2,208	14,425	12,472	-	1,954	63,733	2,282	-	-	-	2,792,550	155,301	-
4a.1.6	Scaffolding in support of decommissioning	-	412	8	2	37	5	-	111	575	575	-	-	349	22	-	-	-	17,641	16,373	-
4a.1	Subtotal Period 4a Activity Costs	145	17,766	8,431	3,810	13,820	35,052	1,230	20,986	101,240	99,287	-	1,954	157,284	71,650	3,330	470	505	12,633,050	305,737	18,857
Period 4a Additional Costs																					
4a.2.1	Retired Reactor Closure Head	-	-	261	477	-	814	-	592	2,145	2,145	-	-	-	3,241	-	-	-	508,950	3,023	2,000
4a.2	Subtotal Period 4a Additional Costs	-	-	261	477	-	814	-	592	2,145	2,145	-	-	-	3,241	-	-	-	508,950	3,023	2,000

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
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(thousands of 2009 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 4a Collateral Costs																					
4a.3.1	Process liquid waste	36	-	20	54	-	85	-	49	244	244	-	-	-	285	-	-	-	17,073	55	-
4a.3.2	Small tool allowance	-	221	-	-	-	-	-	33	254	229	-	25	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	36	221	20	54	-	85	-	82	498	473	-	25	-	285	-	-	-	17,073	55	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	73	-	-	-	-	-	-	18	91	91	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	451	45	496	496	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	108	11	119	107	-	12	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,951	-	-	-	-	-	488	2,438	2,438	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,609	-	-	-	-	-	391	3,000	3,000	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	13	1	-	190	-	49	254	254	-	-	-	3,924	-	-	-	78,476	18	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,381	207	1,588	1,588	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	826	83	909	909	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	461	69	530	530	-	-	-	-	-	-	-	-	-	-
4a.4.10	Security Staff Cost	-	-	-	-	-	-	2,659	399	3,058	3,058	-	-	-	-	-	-	-	-	-	78,393
4a.4.11	DOC Staff Cost	-	-	-	-	-	-	12,037	1,805	13,842	13,842	-	-	-	-	-	-	-	-	-	173,091
4a.4.12	Utility Staff Cost	-	-	-	-	-	-	18,601	2,790	21,392	21,392	-	-	-	-	-	-	-	-	-	313,571
4a.4	Subtotal Period 4a Period-Dependent Costs	73	4,560	13	1	-	190	36,523	6,355	47,716	47,704	-	12	-	3,924	-	-	-	78,476	18	565,056
4a.0	TOTAL PERIOD 4a COST	254	22,547	8,726	4,343	13,820	36,141	37,753	28,016	151,599	149,608	-	1,991	157,284	79,100	3,330	470	505	13,237,550	308,834	585,912
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	114	11	70	6	-	257	-	132	591	591	-	-	-	1,098	-	-	-	98,510	428	-
Disposal of Plant Systems																					
4b.1.2.1	Auxiliary Building HVAC (insulated)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b.1.2.2	Auxiliary Building HVAC (uninsulated)	-	6	0	1	8	-	-	3	18	18	-	-	88	-	-	-	-	3,583	193	-
4b.1.2.3	Batt Rms & Misc Uncontrolled Acc. HVAC	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	53	-
4b.1.2.4	Compressed Air - Instr. Air (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	58	-
4b.1.2.5	Compressed Air - Instrument Air - RCA (i	-	9	0	0	7	-	-	3	20	20	-	-	71	-	-	-	-	2,875	230	-
4b.1.2.6	Compressed Air - Instrument Air - RCA (u	-	105	1	4	67	-	-	37	215	215	-	-	705	-	-	-	-	28,626	2,788	-
4b.1.2.7	Compressed Air - Service Air	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	883	-
4b.1.2.8	Compressed Air - Service Air - RCA	-	122	2	5	86	-	-	44	260	260	-	-	905	-	-	-	-	36,757	3,185	-
4b.1.2.9	Compressed Air -Instr. Air (uninsulated)	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	883	-
4b.1.2.10	Containment Hatches	-	6	0	0	5	-	-	2	14	14	-	-	55	-	-	-	-	2,234	169	-
4b.1.2.11	Containment Hydrogen Purge HVAC	-	32	1	3	57	-	-	17	110	110	-	-	592	-	-	-	-	24,061	928	-
4b.1.2.12	Containment Spray	-	330	38	108	1,748	-	-	365	2,588	2,588	-	-	18,315	-	-	-	-	743,782	9,253	-
4b.1.2.13	Containmnt Ventilation HVAC (insulated)	-	173	16	45	731	-	-	161	1,126	1,126	-	-	7,658	-	-	-	-	310,986	4,712	-
4b.1.2.14	Containmnt Ventilation HVAC(uninsulated)	-	25	1	4	67	-	-	17	114	114	-	-	703	-	-	-	-	28,562	700	-
4b.1.2.15	Control Room HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	62	-
4b.1.2.16	Demineralized & RCS Makeup Water	-	25	-	-	-	-	-	4	29	-	-	29	-	-	-	-	-	-	911	-
4b.1.2.17	Demineralized & RCS Makeup Water - RCA	-	85	1	4	64	-	-	32	187	187	-	-	676	-	-	-	-	27,445	2,061	-
4b.1.2.18	Diesel Gen & Auxiliaries (insulated)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	182	-
4b.1.2.19	Diesel Gen & Auxiliaries (uninsulated)	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	2,239	-
4b.1.2.20	Diesel Generator Fuel Oil	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	364	-
4b.1.2.21	Diesel Room HVAC	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	117	-
4b.1.2.22	Electrical - Clean	-	1,345	-	-	-	-	-	202	1,547	-	-	1,547	-	-	-	-	-	-	49,165	-
4b.1.2.23	Electrical - Contaminated	-	122	2	6	99	-	-	47	277	277	-	-	1,041	-	-	-	-	42,275	3,106	-
4b.1.2.24	Electrical - RCA	-	888	20	56	903	-	-	368	2,235	2,235	-	-	9,465	-	-	-	-	384,395	20,759	-
4b.1.2.25	Fire Protection	-	69	-	-	-	-	-	10	79	-	-	79	-	-	-	-	-	-	2,628	-

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR 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 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)																					
4b.1.2.26	Fire Protection - RCA	-	177	4	12	189	-	-	75	457	457	-	-	1,979	-	-	-	-	80,368	4,497	-
4b.1.2.27	Fuel Building HVAC (uninsulated)	-	5	0	0	6	-	-	2	13	13	-	-	59	-	-	-	-	2,391	151	-
4b.1.2.28	Fuel Handling	-	5	0	0	7	1	-	3	16	16	-	-	76	5	-	-	-	3,504	132	-
4b.1.2.29	Leak Rate Test	-	8	0	1	14	-	-	4	28	28	-	-	145	-	-	-	-	5,873	234	-
4b.1.2.30	Potable Water	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
4b.1.2.31	Radiation Monitoring	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	33	-
4b.1.2.32	Safeguards Building HVAC (insulated)	-	14	0	1	23	-	-	7	46	46	-	-	243	-	-	-	-	9,862	306	-
4b.1.2.33	Safeguards Building HVAC (uninsulated)	-	36	1	3	54	-	-	18	113	113	-	-	571	-	-	-	-	23,182	1,019	-
4b.1.2.34	Service Water	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	1,240	-
4b.1.2.35	Service Water - RCA	-	149	10	29	476	-	-	114	779	779	-	-	4,985	-	-	-	-	202,443	4,360	-
4b.1.2.36	Spent Fuel Pool Cooling & Cleanup	-	106	6	3	34	41	-	43	232	232	-	-	359	174	-	-	-	30,146	2,800	-
4b.1.2.37	Turbine Building HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	92	-
4b.1.2.38	Turbine Building HVAC (uninsulated)	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	722	-
4b.1.2.39	Vents & Drains	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	495	-
4b.1.2.40	Vents & Drains - RCA	-	129	8	4	51	53	-	55	300	300	-	-	538	227	-	-	-	42,230	3,433	-
4b.1.2.41	Waste Management (uninsulated)	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	91	-
4b.1.2.42	Waste Processing Liquid (insulated)	-	111	7	3	24	54	-	46	244	244	-	-	247	231	-	-	-	30,733	2,965	-
4b.1.2.43	Waste Processing Liquid (uninsulated)	-	53	4	2	15	29	-	23	126	126	-	-	159	125	-	-	-	17,530	1,420	-
4b.1.2.44	Waste Processing Solid	-	1	0	0	1	1	-	1	4	4	-	-	14	2	-	-	-	790	47	-
4b.1.2	Totals	-	4,336	126	296	4,738	178	-	1,732	11,406	9,522	-	1,884	49,650	764	-	-	-	2,084,632	129,704	-
4b.1.3	Scaffolding in support of decommissioning	-	618	12	4	55	8	-	166	863	863	-	-	523	33	-	-	-	26,461	24,559	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	947	546	136	58	293	345	-	763	3,088	3,088	-	-	3,072	5,918	-	-	-	713,778	43,076	-
4b.1.4.2	Safeguard	124	41	9	6	61	23	-	89	353	353	-	-	644	367	-	-	-	61,599	4,625	-
4b.1.4	Totals	1,071	587	146	63	355	368	-	852	3,442	3,442	-	-	3,717	6,285	-	-	-	775,377	47,701	-
4b.1	Subtotal Period 4b Activity Costs	1,185	5,552	354	369	5,148	811	-	2,882	16,302	14,418	-	1,884	53,890	8,179	-	-	-	2,984,980	202,392	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	655	197	852	852	-	-	-	-	-	-	-	-	6,240	-
4b.2.2	ISFSI License Termination	-	23	1	8	-	371	696	204	1,304	-	1,304	-	-	1,701	-	-	-	142,522	2,565	1,280
4b.2	Subtotal Period 4b Additional Costs	-	23	1	8	-	371	1,352	401	2,156	852	1,304	-	-	1,701	-	-	-	142,522	8,805	1,280
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	63	-	35	95	-	150	-	87	429	429	-	-	-	502	-	-	-	30,119	98	-
4b.3.2	Small tool allowance	-	118	-	-	-	-	-	18	136	136	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	140	50	634	87	-	138	1,050	1,050	-	-	6,000	373	-	-	-	303,507	88	-
4b.3	Subtotal Period 4b Collateral Costs	63	118	175	145	634	237	-	243	1,616	1,616	-	-	6,000	875	-	-	-	333,626	186	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	822	-	-	-	-	-	-	206	1,028	1,028	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	941	94	1,036	1,036	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	226	23	249	249	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,874	-	-	-	-	-	469	2,343	2,343	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	5,406	-	-	-	-	-	811	6,217	6,217	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	10	1	-	140	-	36	187	187	-	-	-	2,897	-	-	-	57,936	13	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,277	342	2,618	2,618	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,726	173	1,898	1,898	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	962	144	1,107	1,107	-	-	-	-	-	-	-	-	-	-
4b.4.10	Security Staff Cost	-	-	-	-	-	-	871	131	1,001	1,001	-	-	-	-	-	-	-	-	-	28,820

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 4b Period-Dependent Costs (continued)																					
4b.4.11	DOC Staff Cost	-	-	-	-	-	-	15,917	2,388	18,305	18,305	-	-	-	-	-	-	-	-	-	246,280
4b.4.12	Utility Staff Cost	-	-	-	-	-	-	25,181	3,777	28,958	28,958	-	-	-	-	-	-	-	-	-	440,160
4b.4	Subtotal Period 4b Period-Dependent Costs	822	7,280	10	1	-	140	48,101	8,592	64,947	64,947	-	-	-	2,897	-	-	-	57,936	13	715,260
4b.0	TOTAL PERIOD 4b COST	2,070	12,973	539	524	5,783	1,560	49,453	12,118	85,020	81,832	1,304	1,884	59,890	13,652	-	-	-	3,519,063	211,396	716,540
PERIOD 4d - Delay before License Termination																					
Period 4d Direct Decommissioning Activities																					
Period 4d Period-Dependent Costs																					
4d.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4d.4.2	Property taxes	-	-	-	-	-	-	157	16	173	173	-	-	-	-	-	-	-	-	-	-
4d.4.3	Health physics supplies	-	113	-	-	-	-	-	28	142	142	-	-	-	-	-	-	-	-	-	-
4d.4.4	Disposal of DAW generated	-	-	0	0	-	6	-	2	8	8	-	-	-	123	-	-	-	2,456	1	-
4d.4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4d.4.6	NRC Fees	-	-	-	-	-	-	302	30	332	332	-	-	-	-	-	-	-	-	-	-
4d.4.7	Utility Staff Cost	-	-	-	-	-	-	1,426	214	1,640	1,640	-	-	-	-	-	-	-	-	-	25,440
4d.4	Subtotal Period 4d Period-Dependent Costs	-	113	0	0	-	6	1,885	290	2,294	2,294	-	-	-	123	-	-	-	2,456	1	25,440
4d.0	TOTAL PERIOD 4d COST	-	113	0	0	-	6	1,885	290	2,294	2,294	-	-	-	123	-	-	-	2,456	1	25,440
PERIOD 4e - License Termination																					
Period 4e Direct Decommissioning Activities																					
4e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
4e.1.2	Terminate license									a											
4e.1	Subtotal Period 4e Activity Costs	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
Period 4e Additional Costs																					
4e.2.1	License Termination Survey	-	-	-	-	-	-	3,256	977	4,233	4,233	-	-	-	-	-	-	-	-	86,835	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	3,256	977	4,233	4,233	-	-	-	-	-	-	-	-	86,835	3,120
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	68	7	75	75	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	474	-	-	-	-	-	118	592	592	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	12	-	3	16	16	-	-	-	249	-	-	-	4,974	1	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	183	28	211	211	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	560	56	616	616	-	-	-	-	-	-	-	-	-	-
4e.4.7	Security Staff Cost	-	-	-	-	-	-	415	62	477	477	-	-	-	-	-	-	-	-	-	11,871
4e.4.8	DOC Staff Cost	-	-	-	-	-	-	3,249	487	3,736	3,736	-	-	-	-	-	-	-	-	-	47,090
4e.4.9	Utility Staff Cost	-	-	-	-	-	-	3,632	545	4,177	4,177	-	-	-	-	-	-	-	-	-	57,379
4e.4	Subtotal Period 4e Period-Dependent Costs	-	474	1	0	-	12	8,108	1,306	9,901	9,901	-	-	-	249	-	-	-	4,974	1	116,340
4e.0	TOTAL PERIOD 4e COST	-	474	1	0	-	12	13,001	2,551	16,039	16,039	-	-	-	249	-	-	-	4,974	86,836	119,460
PERIOD 4 TOTALS		2,324	36,107	9,266	4,867	19,603	37,719	102,091	42,975	254,952	249,773	1,304	3,875	217,174	93,123	3,330	470	505	16,764,050	607,067	1,447,352

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	5,679	-	-	-	-	-	852	6,531	-	-	6,531	-	-	-	-	-	-	79,426	-
5b.1.1.2	Circ Water Yard Piping	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	36	-
5b.1.1.3	Diesel Generator	-	605	-	-	-	-	-	91	695	-	-	695	-	-	-	-	-	-	8,908	-
5b.1.1.4	Old Steam Generator Storage Facility	-	946	-	-	-	-	-	142	1,087	-	-	1,087	-	-	-	-	-	-	11,858	-
5b.1.1.5	Safeguard	-	2,051	-	-	-	-	-	308	2,358	-	-	2,358	-	-	-	-	-	-	30,287	-
5b.1.1.6	Switchgear	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	2,049	-
5b.1.1.7	Turbine	-	550	-	-	-	-	-	82	632	-	-	632	-	-	-	-	-	-	11,258	-
5b.1.1.8	Turbine Pedestal	-	1,188	-	-	-	-	-	178	1,366	-	-	1,366	-	-	-	-	-	-	15,907	-
5b.1.1	Totals	-	11,147	-	-	-	-	-	1,672	12,819	-	-	12,819	-	-	-	-	-	-	159,729	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	477	-	-	-	-	-	72	549	-	-	549	-	-	-	-	-	-	1,292	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	192	29	221	221	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	11,624	-	-	-	-	192	1,772	13,589	221	-	13,368	-	-	-	-	-	-	161,021	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Processing	-	529	-	-	-	-	2	80	611	-	-	611	-	-	-	-	-	-	2,483	-
5b.2.2	ISFSI Demolition and Site Restoration	-	724	-	-	-	-	25	112	860	-	860	-	-	-	-	-	-	-	14,350	80
5b.2	Subtotal Period 5b Additional Costs	-	1,253	-	-	-	-	27	192	1,471	-	860	611	-	-	-	-	-	-	16,833	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	105	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	105	-	-	-	-	-	16	120	-	-	120	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	180	18	198	-	-	198	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,136	-	-	-	-	-	920	7,056	-	-	7,056	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	241	36	277	-	-	277	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	980	147	1,127	-	-	1,127	-	-	-	-	-	-	-	27,581
5b.4.6	DOC Staff Cost	-	-	-	-	-	-	7,431	1,115	8,546	-	-	8,546	-	-	-	-	-	-	-	110,240
5b.4.7	Utility Staff Cost	-	-	-	-	-	-	3,481	522	4,003	-	-	4,003	-	-	-	-	-	-	-	54,080
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,136	-	-	-	-	12,313	2,758	21,207	-	-	21,207	-	-	-	-	-	-	-	191,901
5b.0	TOTAL PERIOD 5b COST	-	19,118	-	-	-	-	12,532	4,738	36,388	221	860	35,307	-	-	-	-	-	-	177,854	193,541
PERIOD 5 TOTALS		-	19,118	-	-	-	-	12,532	4,738	36,388	221	860	35,307	-	-	-	-	-	-	177,854	193,541
TOTAL COST TO DECOMMISSION		6,584	63,043	9,503	5,385	19,603	39,243	417,517	95,849	656,727	524,948	91,037	40,741	217,174	110,702	3,330	470	505	17,223,360	868,416	5,004,236

Table D-1
Comanche Peak Nuclear Power Plant, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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

TOTAL COST TO DECOMMISSION WITH 17.09% CONTINGENCY:	$656,727	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 79.93% OR:	$524,948	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 13.86% OR:	$91,037	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 6.2% OR:	$40,741	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	114,501	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	51,751	tons
TOTAL CRAFT LABOR REQUIREMENTS:	868,416	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

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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	-	-	-	-	-	-	328	98	426	426	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	556
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	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	856
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	79	12	91	91	-	-	-	-	-	-	-	-	-	642
1a.1.13	Define major work sequence	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	163	24	188	188	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	263	40	303	303	-	-	-	-	-	-	-	-	-	2,140
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	259	39	298	298	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	219	33	252	252	-	-	-	-	-	-	-	-	-	1,783
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,335
1a.1.16.4	Waste management	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	105	16	121	121	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	854	128	982	982	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	62	9	72	72	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	63	9	73	73	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	126	19	144	144	-	-	-	-	-	-	-	-	-	1,020
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	43
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	-	-	-	-	-	-	2,218	382	2,600	2,600	-	-	-	-	-	-	-	-	-	15,361
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,228	1,084	8,312	-	8,312	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	7,228	1,084	8,312	-	8,312	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,005	101	1,106	1,106	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	90	9	99	99	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	404	-	-	-	-	-	101	505	505	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	514	-	-	-	-	-	77	591	591	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	0	-	24	-	6	32	32	-	-	-	493	-	-	-	9,854	2	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,208	181	1,390	1,390	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	485	48	533	533	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	445	44	489	-	489	-	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 Period-Dependent Costs (continued)																					
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	762	114	877	-	877	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	4,999	750	5,749	5,749	-	-	-	-	-	-	-	-	-	157,471
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	24,777	3,717	28,493	28,493	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	918	2	0	-	24	33,816	5,155	39,915	38,498	1,416	-	-	493	-	-	-	9,854	2	580,871
1a.0	TOTAL PERIOD 1a COST	-	918	2	0	-	24	43,262	6,621	50,827	41,098	9,729	-	-	493	-	-	-	9,854	2	596,232
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	1,033	-	-	-	-	-	-	517	1,550	1,550	-	-	-	-	-	-	-	-	30,861	-
1b.1.1.2	Auxiliary	671	-	-	-	-	-	-	335	1,006	1,006	-	-	-	-	-	-	-	-	20,089	-
1b.1.1.3	Radwaste Warehouse	227	-	-	-	-	-	-	113	340	340	-	-	-	-	-	-	-	-	6,787	-
1b.1.1.4	Safeguard	132	-	-	-	-	-	-	66	198	198	-	-	-	-	-	-	-	-	3,960	-
1b.1.1.5	Fuel	672	-	-	-	-	-	-	336	1,008	1,008	-	-	-	-	-	-	-	-	19,958	-
1b.1.1	Totals	2,735	-	-	-	-	-	-	1,367	4,102	4,102	-	-	-	-	-	-	-	-	81,655	-
1b.1	Subtotal Period 1b Activity Costs	2,735	-	-	-	-	-	-	1,367	4,102	4,102	-	-	-	-	-	-	-	-	81,655	-
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	6,460	969	7,429	7,429	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	6,460	969	7,429	7,429	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	991	-	-	-	-	-	-	149	1,140	1,140	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	215	-	101	278	-	437	-	269	1,300	1,300	-	-	-	1,464	-	-	-	87,843	285	-
1b.3.3	Small tool allowance	-	50	-	-	-	-	-	7	57	57	-	-	-	-	-	-	-	-	-	-
1b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,130	169	1,299	-	1,299	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,206	50	101	278	-	437	1,130	594	3,796	2,497	1,299	-	-	1,464	-	-	-	87,843	285	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	1,587	-	-	-	-	-	-	397	1,984	1,984	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	253	25	279	279	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	23	2	25	25	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	493	-	-	-	-	-	123	616	616	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	130	-	-	-	-	-	19	149	149	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	3	0	-	45	-	12	60	60	-	-	-	935	-	-	-	18,700	4	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	305	46	350	350	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	122	12	134	134	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	112	11	123	-	123	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	192	29	221	-	221	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	1,260	189	1,449	1,449	-	-	-	-	-	-	-	-	-	39,691
1b.4.13	Utility Staff Cost	-	-	-	-	-	-	6,245	937	7,182	7,182	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	1,587	622	3	0	-	45	8,523	1,804	12,586	12,229	357	-	-	935	-	-	-	18,700	4	146,411
1b.0	TOTAL PERIOD 1b COST	5,528	672	105	279	-	482	16,113	4,734	27,912	26,256	1,656	-	-	2,399	-	-	-	106,543	81,945	146,411

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	348	-	-	-	-	-	52	400	400	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	22	-	-	-	-	-	3	26	26	-	-			-		-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	16,711	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	31	5	35	35	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	370	-	-	-	-	764	280	1,413	1,413	-	-	-	-	-	-	-	-	20,411	250
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	219	-	103	283	-	444	-	273	1,323	1,323	-	-	-	1,490	-	-	-	89,428	291	-
1c.3.2	Small tool allowance	-	2	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1c.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,142	171	1,313	-	1,313	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	219	2	103	283	-	444	1,142	445	2,639	1,326	1,313	-	-	1,490	-	-	-	89,428	291	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	256	26	282	282	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	23	2	25	25	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	202	-	-	-	-	-	50	252	252	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	131	-	-	-	-	-	20	151	151	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	6	-	2	8	8	-	-	-	126	-	-	-	2,511	1	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	308	46	354	354	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	124	12	136	136	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	113	11	125	-	125	-	-	-	-	-	-	-	-	-
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	194	29	223	-	223	-	-	-	-	-	-	-	-	-
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1c.4.11	Security Staff Cost	-	-	-	-	-	-	1,274	191	1,465	1,465	-	-	-	-	-	-	-	-	-	40,123
1c.4.12	Utility Staff Cost	-	-	-	-	-	-	6,313	947	7,260	7,260	-	-	-	-	-	-	-	-	-	107,880
1c.4	Subtotal Period 1c Period-Dependent Costs	-	333	0	0	-	6	8,616	1,338	10,294	9,933	361	-	-	126	-	-	-	2,511	1	148,003
1c.0	TOTAL PERIOD 1c COST	219	705	104	284	-	451	10,522	2,063	14,346	12,672	1,674	-	-	1,616	-	-	-	91,939	20,702	148,253
PERIOD 1 TOTALS		5,747	2,295	210	562	-	956	69,897	13,419	93,086	80,026	13,059	-	-	4,508	-	-	-	208,336	102,649	890,896
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	-	-	-	-	-	-	1,118	168	1,286	1,286	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	502	126	628	628	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,620	293	1,914	1,914	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	14,690	2,203	16,893	-	16,893	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	14,690	2,203	16,893	-	16,893	-	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,498	150	1,648	1,385	262	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	360	36	396	396	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	366	-	-	-	-	-	92	458	458	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	4	0	-	57	-	15	76	76	-	-	-	1,182	-	-	-	23,646	5	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	966	145	1,111	555	555	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	676	68	744	744	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	899	90	989	-	989	-	-	-	-	-	-	-	-	-
2a.4.8	Decommissioning Staff Severance	-	-	-	-	-	-	6,689	1,003	7,693	-	7,693	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	3,047	457	3,504	-	3,504	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	176	26	202	-	202	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	14,379	2,157	16,536	2,551	13,985	-	-	-	-	-	-	-	-	443,953
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	20,315	3,047	23,362	3,503	19,859	-	-	-	-	-	-	-	-	329,317
2a.4	Subtotal Period 2a Period-Dependent Costs	-	366	4	0	-	57	49,006	7,286	56,719	9,669	47,050	-	-	1,182	-	-	-	23,646	5	773,270
2a.0	TOTAL PERIOD 2a COST	-	366	4	0	-	57	65,316	9,782	75,527	11,583	63,943	-	-	1,182	-	-	-	23,646	5	773,270
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	-	-	-	-	-	-	7,392	1,109	8,501	8,501	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	3,322	831	4,153	4,153	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	10,715	1,939	12,654	12,654	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,215	482	3,697	-	3,697	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	3,215	482	3,697	-	3,697	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	8,691	869	9,561	9,161	400	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	2,379	238	2,617	2,617	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,783	-	-	-	-	-	446	2,228	2,228	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	23	3	-	333	-	86	445	445	-	-	-	6,878	-	-	-	137,566	32	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	3,194	479	3,673	3,673	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	4,473	447	4,920	4,920	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	5,943	594	6,537	-	6,537	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,162	174	1,336	-	1,336	-	-	-	-	-	-	-	-	-
2b.4.9	Security Staff Cost	-	-	-	-	-	-	25,676	3,851	29,527	16,866	12,662	-	-	-	-	-	-	-	-	744,197
2b.4.10	Utility Staff Cost	-	-	-	-	-	-	33,282	4,992	38,274	23,164	15,110	-	-	-	-	-	-	-	-	551,257
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,783	23	3	-	333	84,800	12,177	99,119	63,074	36,045	-	-	6,878	-	-	-	137,566	32	1,295,454
2b.0	TOTAL PERIOD 2b COST	-	1,783	23	3	-	333	98,729	14,599	115,470	75,728	39,741	-	-	6,878	-	-	-	137,566	32	1,295,454
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	-	-	-	-	-	-	5,203	780	5,984	5,984	-	-	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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
2c.1.5	Maintenance supplies	-	-	-	-	-	-	2,338	585	2,923	2,923	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	7,542	1,365	8,907	8,907	-	-	-	-	-	-	-	-	-	-
	Period 2c Period-Dependent Costs																				
2c.4.1	Insurance	-	-	-	-	-	-	5,862	586	6,448	6,448	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	1,675	167	1,842	1,842	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	1,197	-	-	-	-	-	299	1,496	1,496	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	16	2	-	230	-	59	308	308	-	-	-	4,757	-	-	-	95,131	22	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	2,248	337	2,585	2,585	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	2,985	298	3,283	3,283	-	-	-	-	-	-	-	-	-	-
2c.4.7	Security Staff Cost	-	-	-	-	-	-	10,323	1,548	11,871	11,871	-	-	-	-	-	-	-	-	-	271,988
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	14,178	2,127	16,304	16,304	-	-	-	-	-	-	-	-	-	241,336
2c.4	Subtotal Period 2c Period-Dependent Costs	-	1,197	16	2	-	230	37,269	5,423	44,137	44,137	-	-	-	4,757	-	-	-	95,131	22	513,324
2c.0	TOTAL PERIOD 2c COST	-	1,197	16	2	-	230	44,810	6,788	53,044	53,044	-	-	-	4,757	-	-	-	95,131	22	513,324
PERIOD 2 TOTALS		-	3,346	43	5	-	621	208,856	31,169	244,040	140,355	103,685	-	-	12,817	-	-	-	256,344	59	2,582,048
	PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																				
	Period 3a Direct Decommissioning Activities																				
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	242	36	279	279	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	68	10	79	79	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	395	59	454	454	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	163	24	188	188	-	-	-	-	-	-	-	-	-	1,327
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	263	40	303	303	-	-	-	-	-	-	-	-	-	2,140
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	216	32	248	248	-	-	-	-	-	-	-	-	-	1,753
3a.1.10	Receive NRC approval of termination plan									a											
	Activity Specifications																				
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	388	58	446	402	-	45	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	219	33	252	227	-	25	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	374	56	430	430	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	342	51	394	394	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	26	4	30	30	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	84	13	97	48	-	48	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	21	3	24	-	-	24	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	21	3	24	-	-	24	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	164	25	189	94	-	94	-	-	-	-	-	-	-	1,335
3a.1.11.11	Waste management	-	-	-	-	-	-	242	36	279	279	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	47	7	55	27	-	27	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	2,095	314	2,409	2,121	-	289	-	-	-	-	-	-	-	17,024
	Planning & Site Preparations																				
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	1,027
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	74	11	85	85	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	8,829	1,324	10,154	9,865	-	289	-	-	-	-	-	-	-	31,117
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	315	32	347	347	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	90	9	99	99	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	316	-	-	-	-	-	79	395	395	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	514	-	-	-	-	-	77	591	591	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	1	0	-	18	-	5	24	24	-	-	-	364	-	-	-	7,277	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,208	181	1,390	1,390	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	208	21	229	229	-	-	-	-	-	-	-	-	-	-
3a.4.8	Security Staff Cost	-	-	-	-	-	-	189	28	217	217	-	-	-	-	-	-	-	-	-	6,257
3a.4.9	Utility Staff Cost	-	-	-	-	-	-	11,357	1,703	13,060	13,060	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	830	1	0	-	18	13,367	2,135	16,351	16,351	-	-	-	364	-	-	-	7,277	2	206,486
3a.0	TOTAL PERIOD 3a COST	-	830	1	0	-	18	22,196	3,459	26,504	26,216	-	289	-	364	-	-	-	7,277	2	237,603
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	249	37	287	258	-	29	-	-	-	-	-	-	-	2,026
3b.1.1.2	Reactor internals	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,070
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	71	11	82	20	-	61	-	-	-	-	-	-	-	578
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	191	29	220	220	-	-	-	-	-	-	-	-	-	1,554
3b.1.1.8	Facility closeout	-	-	-	-	-	-	63	9	73	36	-	36	-	-	-	-	-	-	-	514
3b.1.1.9	Missile shields	-	-	-	-	-	-	24	4	27	27	-	-	-	-	-	-	-	-	-	193
3b.1.1.10	Biological shield	-	-	-	-	-	-	63	9	73	73	-	-	-	-	-	-	-	-	-	514
3b.1.1.11	Steam generators	-	-	-	-	-	-	242	36	279	279	-	-	-	-	-	-	-	-	-	1,969
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	53	8	61	30	-	30	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	82	12	94	-	-	94	-	-	-	-	-	-	-	668
3b.1.1.14	Main Condensers	-	-	-	-	-	-	82	12	94	-	-	94	-	-	-	-	-	-	-	668
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	144	22	165	149	-	17	-	-	-	-	-	-	-	1,168
3b.1.1.16	Reactor building	-	-	-	-	-	-	144	22	165	149	-	17	-	-	-	-	-	-	-	1,168
3b.1.1	Total	-	-	-	-	-	-	1,698	255	1,953	1,574	-	379	-	-	-	-	-	-	-	13,800
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,698	255	1,953	1,574	-	379	-	-	-	-	-	-	-	13,800
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	1,849	555	2,404	2,404	-	-	-	-	-	-	-	-	11,831	4,332
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	1,849	555	2,404	2,404	-	-	-	-	-	-	-	-	11,831	4,332
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	991	-	-	-	-	-	-	149	1,140	1,140	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	991	1,100	-	-	-	-	1,486	537	4,113	4,113	-	-	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
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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 Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	31	-	-	-	-	-	-	8	38	38	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	190	19	209	209	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	46	5	50	50	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	177	-	-	-	-	-	44	221	221	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	261	-	-	-	-	-	39	300	300	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	1	0	-	10	-	3	14	14	-	-	-	209	-	-	-	4,189	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	612	92	704	704	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	105	11	116	116	-	-	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	96	14	110	110	-	-	-	-	-	-	-	-	-	3,171
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	2,973	446	3,419	3,419	-	-	-	-	-	-	-	-	-	43,343
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	5,756	863	6,620	6,620	-	-	-	-	-	-	-	-	-	101,486
3b.4	Subtotal Period 3b Period-Dependent Costs	31	438	1	0	-	10	9,778	1,543	11,801	11,801	-	-	-	209	-	-	-	4,189	1	148,000
3b.0	TOTAL PERIOD 3b COST	1,022	1,538	1	0	-	10	14,811	2,889	20,271	19,892	-	379	-	209	-	-	-	4,189	11,832	166,132
PERIOD 3 TOTALS		1,022	2,368	2	0	-	28	37,007	6,349	46,775	46,108	-	667	-	573	-	-	-	11,465	11,834	403,735
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	16	78	16	7	94	114	-	73	398	398	-	-	361	361	-	-	-	83,745	2,449	-
4a.1.1.2	Pressurizer Relief Tank	4	15	7	3	43	48	-	25	145	145	-	-	165	165	-	-	-	36,553	596	-
4a.1.1.3	Reactor Coolant Pumps & Motors	17	53	46	92	-	2,030	-	548	2,786	2,786	-	-	-	7,231	-	-	-	792,800	2,801	80
4a.1.1.4	Pressurizer	6	32	338	73	-	967	-	297	1,713	1,713	-	-	-	3,445	-	-	-	251,471	1,512	750
4a.1.1.5	Steam Generators	51	3,087	1,260	1,245	2,946	6,379	-	3,146	18,113	18,113	-	-	40,067	23,397	-	-	-	3,329,768	20,508	1,500
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	21	66	255	15	127	149	-	111	742	742	-	-	1,458	3,044	-	-	-	111,119	2,342	-
4a.1.1.7	Reactor Vessel Internals	31	1,778	3,690	249	-	3,769	169	4,244	13,929	13,929	-	-	-	2,312	376	470	-	326,129	17,867	847
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	10,837	-	1,626	12,462	12,462	-	-	-	-	-	-	505	104,146	-	-
4a.1.1.9	Reactor Vessel	-	3,747	975	108	-	3,881	169	5,047	13,927	13,927	-	-	-	6,672	2,955	-	-	985,324	17,867	847
4a.1.1	Totals	145	8,855	6,586	1,792	3,210	28,173	339	15,116	64,216	64,216	-	-	42,051	46,626	3,330	470	505	6,021,054	65,942	4,023
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	219	225	55	787	-	-	204	1,490	1,490	-	-	3,939	-	-	-	-	334,798	7,226	-
4a.1.3	Main Condensers	-	693	156	46	752	-	-	309	1,956	1,956	-	-	7,111	-	-	-	-	320,000	22,781	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,002	-	-	-	-	-	150	1,152	1,152	-	-	-	-	-	-	-	-	13,996	-
4a.1.4.2	Auxiliary	-	472	-	-	-	-	-	71	542	542	-	-	-	-	-	-	-	-	6,783	-
4a.1.4.3	Safeguard	-	108	-	-	-	-	-	16	124	124	-	-	-	-	-	-	-	-	1,588	-
4a.1.4.4	Fuel	-	467	-	-	-	-	-	70	537	537	-	-	-	-	-	-	-	-	6,652	-
4a.1.4	Totals	-	2,048	-	-	-	-	-	307	2,355	2,355	-	-	-	-	-	-	-	-	29,019	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwater (insulated)	-	519	20	55	896	-	-	274	1,764	1,764	-	-	9,388	-	-	-	-	381,245	13,999	-
4a.1.5.2	Auxiliary Steam	-	97	-	-	-	-	-	15	111	-	-	111	-	-	-	-	-	-	3,676	-
4a.1.5.3	Boron Recycle (insulated)	-	29	2	1	9	11	-	12	63	63	-	-	96	46	-	-	-	7,980	793	-
4a.1.5.4	Boron Recycle (uninsulated)	-	282	19	26	387	84	-	155	954	954	-	-	4,060	391	-	-	-	196,954	8,218	-
4a.1.5.5	Boron Thermal Regeneration (insulated)	-	68	4	2	26	26	-	28	154	154	-	-	275	112	-	-	-	21,205	1,839	-
4a.1.5.6	Boron Thermal Regeneration (uninsulated)	-	181	11	8	103	71	-	81	455	455	-	-	1,082	307	-	-	-	71,239	4,995	-
4a.1.5.7	Carbon Dioxide Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	20	-

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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 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)																					
4a.1.5.8	Chemical & Volume Control (Insulated)	-	160	9	5	55	60	-	65	352	352	-	-	574	255	-	-	-	46,114	4,319	-
4a.1.5.9	Chemical & Volume Control (uninsulated)	-	417	26	27	384	145	-	205	1,205	1,205	-	-	4,026	642	-	-	-	218,992	11,854	-
4a.1.5.10	Chemical Feed	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	421	-
4a.1.5.11	Chemical Feed - RCA	-	7	0	0	2	-	-	2	12	12	-	-	20	-	-	-	-	821	252	-
4a.1.5.12	Chilled Water - Safety	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	159	-
4a.1.5.13	Chilled Water - Safety - RCA	-	88	1	4	62	-	-	32	187	187	-	-	648	-	-	-	-	26,322	2,200	-
4a.1.5.14	Chlorine	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	369	-
4a.1.5.15	Circulating Water	-	273	-	-	-	-	-	41	314	-	-	314	-	-	-	-	-	-	10,429	-
4a.1.5.16	Component Cooling Water	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	763	-
4a.1.5.17	Component Cooling Water - RCA	-	947	52	145	2,362	-	-	618	4,123	4,123	-	-	24,747	-	-	-	-	1,004,999	25,519	-
4a.1.5.18	Condensate (insulated)	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	4,373	-
4a.1.5.19	Condensate (uninsulated)	-	95	-	-	-	-	-	14	110	-	-	110	-	-	-	-	-	-	3,541	-
4a.1.5.20	Condensate Polishing	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	3,327	-
4a.1.5.21	Condenser Vacuum & Water Box Priming	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	2,017	-
4a.1.5.22	Extraction Steam	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,806	-
4a.1.5.23	Feedwater	-	185	-	-	-	-	-	28	213	-	-	213	-	-	-	-	-	-	7,084	-
4a.1.5.24	Feedwater - RCA	-	52	4	10	166	-	-	40	272	272	-	-	1,741	-	-	-	-	70,723	1,449	-
4a.1.5.25	Generator & Exciter	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
4a.1.5.26	Generator Gas Cooling	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	247	-
4a.1.5.27	Generator Primary Water	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,745	-
4a.1.5.28	Generator Seal Oil	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	218	-
4a.1.5.29	Hydrogen Gas	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	54	-
4a.1.5.30	Main Steam Reheat & Steam Dump	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	1,136	-
4a.1.5.31	Main Steam Reheat & Steam Dump - RCA	-	385	16	46	747	-	-	217	1,411	1,411	-	-	7,827	-	-	-	-	317,874	10,257	-
4a.1.5.32	Main Turbine Lube Oil	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,383	-
4a.1.5.33	Main Turbine Oil Purification	-	70	-	-	-	-	-	11	81	-	-	81	-	-	-	-	-	-	2,563	-
4a.1.5.34	Nitrogen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
4a.1.5.35	Oxygen Gas	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	42	-
4a.1.5.36	Post Accident Sampling	-	7	0	0	2	-	-	2	11	11	-	-	20	-	-	-	-	811	221	-
4a.1.5.37	Process Sampling (uninsulated)	-	7	1	1	24	-	-	6	39	39	-	-	247	-	-	-	-	10,030	236	-
4a.1.5.38	Reactor Coolant	-	93	7	3	30	50	-	41	225	225	-	-	319	214	-	-	-	32,110	2,527	-
4a.1.5.39	Reservoir Makeup Water	-	73	-	-	-	-	-	11	84	-	-	84	-	-	-	-	-	-	2,790	-
4a.1.5.40	Reservoir Return Water	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	2,095	-
4a.1.5.41	Reservoir Service Tower	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	308	-
4a.1.5.42	Residual Heat Removal	-	185	33	43	615	194	-	197	1,266	1,266	-	-	6,448	829	-	-	-	336,207	5,506	-
4a.1.5.43	Safety Injection (insulated)	-	101	4	12	194	-	-	57	368	368	-	-	2,032	-	-	-	-	82,534	2,690	-
4a.1.5.44	Safety Injection (uninsulated)	-	304	22	61	986	-	-	235	1,607	1,607	-	-	10,333	-	-	-	-	419,611	9,137	-
4a.1.5.45	Secondary Plant Sampling	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	1,040	-
4a.1.5.46	Steam Generator Blowdown & Cleanup	-	112	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	4,265	-
4a.1.5.47	Turbine Electrohydr Cntrl (Insulated)	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	838	-
4a.1.5.48	Turbine Electrohydr Cntrl (uninsulated)	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	552	-
4a.1.5.49	Turbine Gland Steam & Drains	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	1,133	-
4a.1.5.50	Turbine Heater Drains	-	319	-	-	-	-	-	48	367	-	-	367	-	-	-	-	-	-	12,296	-
4a.1.5.51	Turbine Plant Cooling (Insulated)	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	549	-
4a.1.5.52	Turbine Plant Cooling (uninsulated)	-	115	-	-	-	-	-	17	133	-	-	133	-	-	-	-	-	-	4,420	-
4a.1.5.53	Turbines (HIGH - LOW) (Insulated)	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	156	-
4a.1.5.54	Turbines (HIGH - LOW) (uninsulated)	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	474	-
4a.1.5.55	Vent Chilled Water - Non Safety	-	63	-	-	-	-	-	9	73	-	-	73	-	-	-	-	-	-	2,423	-
4a.1.5.56	Vent Chilled Water - Non Safety - RCA	-	529	15	41	671	-	-	240	1,496	1,496	-	-	7,033	-	-	-	-	285,611	13,663	-
4a.1.5.57	Westinghouse Process Instruments	-	3	0	0	2	1	-	1	7	7	-	-	16	3	-	-	-	913	99	-
4a.1.5	*Totals*	-	6,431	244	491	7,724	641	-	2,818	18,348	15,971	-	2,378	80,933	2,797	-	-	-	3,532,293	198,662	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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
4a.1.6	Scaffolding in support of decommissioning	-	970	31	9	139	19	-	272	1,440	1,440	-	-	1,313	82	-	-	-	66,395	36,951	-
4a.1	Subtotal Period 4a Activity Costs	145	19,217	7,241	2,393	12,611	28,833	339	19,026	89,804	87,427	-	2,378	135,346	49,505	3,330	470	505	10,274,540	360,581	4,023
Period 4a Additional Costs																					
4a.2.1	Retired HP & LP Turbine Rotors	-	-	340	56	-	1,244	-	353	1,993	1,993	-	-	-	5,014	-	-	-	696,000	1,200	1,000
4a.2	Subtotal Period 4a Additional Costs	-	-	340	56	-	1,244	-	353	1,993	1,993	-	-	-	5,014	-	-	-	696,000	1,200	1,000
Period 4a Collateral Costs																					
4a.3.1	Process liquid waste	39	-	21	58	-	90	-	53	260	260	-	-	-	303	-	-	-	18,167	59	-
4a.3.2	Small tool allowance	-	226	-	-	-	-	-	34	260	234	-	26	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	39	226	21	58	-	90	-	87	520	494	-	26	-	303	-	-	-	18,167	59	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	67	-	-	-	-	-	-	17	84	84	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	414	41	455	455	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	99	10	109	98	-	11	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	2,165	-	-	-	-	-	541	2,706	2,706	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,195	-	-	-	-	-	359	2,754	2,754	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	16	2	-	224	-	58	299	299	-	-	-	4,625	-	-	-	92,503	21	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,267	190	1,458	1,458	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	511	51	562	562	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	423	63	486	486	-	-	-	-	-	-	-	-	-	-
4a.4.10	Security Staff Cost	-	-	-	-	-	-	2,441	366	2,807	2,807	-	-	-	-	-	-	-	-	-	71,964
4a.4.11	DOC Staff Cost	-	-	-	-	-	-	11,049	1,657	12,707	12,707	-	-	-	-	-	-	-	-	-	158,897
4a.4.12	Utility Staff Cost	-	-	-	-	-	-	17,076	2,561	19,637	19,637	-	-	-	-	-	-	-	-	-	287,857
4a.4	Subtotal Period 4a Period-Dependent Costs	67	4,560	16	2	-	224	33,281	5,916	44,065	44,054	-	11	-	4,625	-	-	-	92,503	21	518,719
4a.0	TOTAL PERIOD 4a COST	251	24,003	7,617	2,508	12,611	30,391	33,620	25,382	136,382	133,968	-	2,414	135,346	59,447	3,330	470	505	11,081,210	361,861	523,742
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	114	11	70	6	-	257	-	132	591	591	-	-	-	1,098	-	-	-	98,510	428	-
Disposal of Plant Systems																					
4b.1.2.1	Auxiliary Building HVAC (insulated)	-	43	2	4	73	-	-	23	145	145	-	-	766	-	-	-	-	31,127	967	-
4b.1.2.2	Auxiliary Building HVAC (uninsulated)	-	53	2	5	85	-	-	27	171	171	-	-	891	-	-	-	-	36,183	1,273	-
4b.1.2.3	Batt Rms & Misc Uncontrolled Acc. HVAC	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	91	-
4b.1.2.4	Compressed Air - Instr. Air (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	83	-
4b.1.2.5	Compressed Air - Instrument Air - RCA (i	-	38	0	1	16	-	-	12	67	67	-	-	167	-	-	-	-	6,768	1,170	-
4b.1.2.6	Compressed Air - Instrument Air - RCA (u	-	118	2	5	85	-	-	43	254	254	-	-	893	-	-	-	-	36,261	2,933	-
4b.1.2.7	Compressed Air - Service Air	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	886	-
4b.1.2.8	Compressed Air - Service Air - RCA	-	122	2	5	77	-	-	43	248	248	-	-	802	-	-	-	-	32,579	3,243	-
4b.1.2.9	Compressed Air - Instr. Air(uninsulated)	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	1,267	-
4b.1.2.10	Containment Hatches	-	14	0	1	12	-	-	5	32	32	-	-	129	-	-	-	-	5,257	365	-
4b.1.2.11	Containment Hydrogen Purge HVAC	-	45	2	5	76	-	-	24	152	152	-	-	801	-	-	-	-	32,515	1,290	-
4b.1.2.12	Containment Spray	-	338	39	108	1,764	-	-	369	2,618	2,618	-	-	18,482	-	-	-	-	750,573	9,487	-
4b.1.2.13	Containment Ventilation HVAC (uninsul)	-	25	1	4	67	-	-	17	114	114	-	-	703	-	-	-	-	28,562	700	-
4b.1.2.14	Containment Ventilation HVAC(insulated)	-	170	16	46	747	-	-	163	1,142	1,142	-	-	7,825	-	-	-	-	317,781	4,573	-
4b.1.2.15	Control Room HVAC	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	1,144	-
4b.1.2.16	Demineralized & RCS Makeup Water	-	101	-	-	-	-	-	15	116	-	-	116	-	-	-	-	-	-	3,662	-
4b.1.2.17	Demineralized & RCS Makeup Water - RCA	-	377	6	18	296	-	-	142	840	840	-	-	3,102	-	-	-	-	125,978	9,392	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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)																					
4b.1.2.18	Diesel Gen & Auxiliaries (insulated)	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	185	-
4b.1.2.19	Diesel Gen & Auxiliaries (uninsulated)	-	62	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	2,314	-
4b.1.2.20	Diesel Generator Fuel Oil	-	10	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	365	-
4b.1.2.21	Diesel Room HVAC	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	117	-
4b.1.2.22	Electrical - Clean	-	1,554	-	-	-	-	-	233	1,787	-	-	1,787	-	-	-	-	-	-	56,765	-
4b.1.2.23	Electrical - Contaminated	-	245	7	17	262	17	-	108	656	656	-	-	2,749	73	-	-	-	118,221	6,558	-
4b.1.2.24	Electrical - Contaminated FHB	-	57	1	3	52	3	-	23	140	140	-	-	546	15	-	-	-	23,478	1,494	-
4b.1.2.25	Electrical - RCA	-	2,197	53	152	2,467	-	-	947	5,815	5,815	-	-	25,849	-	-	-	-	1,049,729	58,812	-
4b.1.2.26	Electrical - RCA FHB	-	411	14	31	491	32	-	190	1,169	1,169	-	-	5,146	137	-	-	-	221,262	10,133	-
4b.1.2.27	Fire Protection	-	397	-	-	-	-	-	60	457	-	-	457	-	-	-	-	-	-	14,858	-
4b.1.2.28	Fire Protection - RCA	-	703	20	56	910	-	-	323	2,011	2,011	-	-	9,532	-	-	-	-	387,103	18,179	-
4b.1.2.29	Fuel Building HVAC (insulated)	-	19	1	2	33	-	-	10	65	65	-	-	347	-	-	-	-	14,073	437	-
4b.1.2.30	Fuel Building HVAC (uninsulated)	-	24	1	2	39	-	-	12	78	78	-	-	405	-	-	-	-	16,464	588	-
4b.1.2.31	Fuel Handling	-	5	0	0	7	1	-	3	16	16	-	-	76	5	-	-	-	3,504	132	-
4b.1.2.32	Leak Rate Test	-	4	0	0	5	-	-	2	10	10	-	-	47	-	-	-	-	1,917	108	-
4b.1.2.33	Misc Plant HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	72	-
4b.1.2.34	Misc Plant HVAC (uninsulated)	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	955	-
4b.1.2.35	Miscellaneous Equipment	-	5	0	1	10	-	-	3	19	19	-	-	105	-	-	-	-	4,266	155	-
4b.1.2.36	Office & Service HVAC	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	84	-
4b.1.2.37	Potable Water	-	52	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,892	-
4b.1.2.38	Primary Plant HVAC (insulated)	-	45	2	5	76	-	-	23	150	150	-	-	795	-	-	-	-	32,303	1,004	-
4b.1.2.39	Primary Plant HVAC (uninsulated)	-	80	4	11	175	-	-	48	317	317	-	-	1,831	-	-	-	-	74,376	2,108	-
4b.1.2.40	Radiation Monitoring	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	102	-
4b.1.2.41	Safeguards Building HVAC (insulated)	-	14	0	1	23	-	-	7	46	46	-	-	243	-	-	-	-	9,862	306	-
4b.1.2.42	Safeguards Building HVAC (uninsulated)	-	36	1	3	54	-	-	18	113	113	-	-	571	-	-	-	-	23,182	1,019	-
4b.1.2.43	Service Water	-	49	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,882	-
4b.1.2.44	Service Water - RCA	-	187	15	42	689	-	-	158	1,091	1,091	-	-	7,217	-	-	-	-	293,103	5,265	-
4b.1.2.45	Sewage Treatment	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	678	-
4b.1.2.46	Spent Fuel Pool Cooling & Cleanup	-	710	59	56	766	377	-	401	2,369	2,369	-	-	8,022	1,611	-	-	-	470,187	19,622	-
4b.1.2.47	Turbine Building HVAC (insulated)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	92	-
4b.1.2.48	Turbine Building HVAC (uninsulated)	-	22	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	840	-
4b.1.2.49	UPS HVAC	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	39	-
4b.1.2.50	Vents & Drains	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	1,092	-
4b.1.2.51	Vents & Drains - RCA	-	374	21	14	159	149	-	159	876	876	-	-	1,670	638	-	-	-	125,003	10,174	-
4b.1.2.52	Waste Management (insulated)	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	399	-
4b.1.2.53	Waste Management (uninsulated)	-	107	-	-	-	-	-	16	123	-	-	123	-	-	-	-	-	-	4,043	-
4b.1.2.54	Waste Processing Gas (uninsulated)	-	73	5	14	221	-	-	54	366	366	-	-	2,316	-	-	-	-	94,036	2,334	-
4b.1.2.55	Waste Processing Liquid (insulated)	-	236	16	6	52	112	-	97	519	519	-	-	540	480	-	-	-	64,978	6,363	-
4b.1.2.56	Waste Processing Liquid (uninsulated)	-	298	39	31	411	234	-	203	1,217	1,217	-	-	4,306	1,230	-	-	-	264,642	9,006	-
4b.1.2.57	Waste Processing Solid	-	17	2	3	48	13	-	15	99	99	-	-	502	56	-	-	-	25,353	532	-
4b.1.2.58	Water Treatment (insulated)	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,780	-
4b.1.2.59	Water Treatment (uninsulated)	-	490	-	-	-	-	-	73	563	-	-	563	-	-	-	-	-	-	18,716	-
4b.1.2	Totals	-	10,161	333	654	10,248	939	-	4,136	26,470	22,928	-	3,542	107,378	4,244	-	-	-	4,720,620	304,128	-
4b.1.3	Scaffolding in support of decommissioning	-	1,455	46	14	208	29	-	409	2,160	2,160	-	-	1,969	123	-	-	-	99,592	55,426	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	947	546	136	58	293	345	-	763	3,088	3,088	-	-	3,072	5,918	-	-	-	713,778	43,076	-
4b.1.4.2	Auxiliary	633	195	61	27	159	153	-	438	1,665	1,665	-	-	1,670	2,611	-	-	-	326,200	22,801	-
4b.1.4.3	Radwaste Warehouse	210	11	3	1	-	8	-	110	343	343	-	-	-	135	-	-	-	13,482	6,384	-
4b.1.4.4	Safeguard	124	41	9	6	61	23	-	89	353	353	-	-	644	367	-	-	-	61,599	4,625	-
4b.1.4.5	Fuel	611	626	26	25	374	61	-	540	2,263	2,263	-	-	3,919	772	-	-	-	233,846	37,849	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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
4b.1.4	Totals	2,525	1,419	236	116	888	590	-	1,939	7,713	7,713	-	-	9,305	9,803	-	-	-	1,348,904	114,734	-
4b.1	Subtotal Period 4b Activity Costs	2,639	13,045	685	790	11,344	1,815	-	6,615	36,934	33,392	-	3,542	118,652	15,268	-	-	-	6,267,626	474,717	-
	Period 4b Additional Costs																				
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	655	197	852	852	-	-	-	-	-	-	-	-	6,240	-
4b.2.2	ISFSI License Termination	-	23	1	8	-	371	696	204	1,304	-	1,304	-	-	1,701	-	-	-	142,522	2,565	1,280
4b.2	Subtotal Period 4b Additional Costs	-	23	1	8	-	371	1,352	401	2,156	852	1,304	-	-	1,701	-	-	-	142,522	8,805	1,280
	Period 4b Collateral Costs																				
4b.3.1	Process liquid waste	80	-	44	121	-	189	-	110	544	544	-	-	-	635	-	-	-	38,106	124	-
4b.3.2	Small tool allowance	-	277	-	-	-	-	-	42	319	319	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	140	50	634	87	-	138	1,050	1,050	-	-	6,000	373	-	-	-	303,507	88	-
4b.3	Subtotal Period 4b Collateral Costs	80	277	184	171	634	277	-	290	1,913	1,913	-	-	6,000	1,009	-	-	-	341,613	212	-
	Period 4b Period-Dependent Costs																				
4b.4.1	Decon supplies	1,762	-	-	-	-	-	-	441	2,203	2,203	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,180	118	1,298	1,298	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	283	28	312	312	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	3,533	-	-	-	-	-	883	4,416	4,416	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	6,773	-	-	-	-	-	1,016	7,789	7,789	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	22	2	-	321	-	83	429	429	-	-	-	6,630	-	-	-	132,596	30	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,853	428	3,281	3,281	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,457	146	1,603	1,603	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,206	181	1,387	1,387	-	-	-	-	-	-	-	-	-	-
4b.4.10	Security Staff Cost	-	-	-	-	-	-	6,959	1,044	8,003	8,003	-	-	-	-	-	-	-	-	-	205,179
4b.4.11	DOC Staff Cost	-	-	-	-	-	-	30,616	4,592	35,209	35,209	-	-	-	-	-	-	-	-	-	439,903
4b.4.12	Utility Staff Cost	-	-	-	-	-	-	46,329	6,949	53,278	53,278	-	-	-	-	-	-	-	-	-	774,754
4b.4	Subtotal Period 4b Period-Dependent Costs	1,762	10,306	22	2	-	321	90,883	15,909	119,207	119,207	-	-	-	6,630	-	-	-	132,596	30	1,419,836
4b.0	TOTAL PERIOD 4b COST	4,482	23,652	892	971	11,978	2,784	92,235	23,215	160,210	155,364	1,304	3,542	124,652	24,608	-	-	-	6,884,358	483,764	1,421,116
	PERIOD 4e - License Termination																				
	Period 4e Direct Decommissioning Activities																				
4e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
4e.1.2	Terminate license									a											
4e.1	Subtotal Period 4e Activity Costs	-	-	-	-	-	-	151	45	197	197	-	-	-	-	-	-	-	-	-	-
	Period 4e Additional Costs																				
4e.2.1	License Termination Survey	-	-	-	-	-	-	5,444	1,633	7,077	7,077	-	-	-	-	-	-	-	-	153,525	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	5,444	1,633	7,077	7,077	-	-	-	-	-	-	-	-	153,525	3,120
	Period 4e Collateral Costs																				
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,486	223	1,709	1,709	-	-	-	-	-	-	-	-	-	-
	Period 4e Period-Dependent Costs																				
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	68	7	75	75	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	668	-	-	-	-	-	167	835	835	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	12	-	3	16	16	-	-	-	249	-	-	-	4,974	1	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	183	28	211	211	-	-	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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 Llc. 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 4e Period-Dependent Costs (continued)																					
4e.4.6	NRC Fees	-	-	-	-	-	-	368	37	405	405	-	-	-	-	-	-	-	-	-	-
4e.4.7	Security Staff Cost	-	-	-	-	-	-	415	62	477	477	-	-	-	-	-	-	-	-	-	11,871
4e.4.8	DOC Staff Cost	-	-	-	-	-	-	3,249	487	3,736	3,736	-	-	-	-	-	-	-	-	-	47,090
4e.4.9	Utility Staff Cost	-	-	-	-	-	-	3,632	545	4,177	4,177	-	-	-	-	-	-	-	-	-	57,379
4e.4	Subtotal Period 4e Period-Dependent Costs	-	668	1	0	-	12	7,915	1,336	9,932	9,932	-	-	-	249	-	-	-	4,974	1	116,340
4e.0	TOTAL PERIOD 4e COST	-	668	1	0	-	12	14,996	3,237	18,914	18,914	-	-	-	249	-	-	-	4,974	153,526	119,460
PERIOD 4 TOTALS		4,732	48,323	8,510	3,479	24,589	33,188	140,851	51,834	315,506	308,246	1,304	5,956	259,998	84,303	3,330	470	505	17,970,540	999,152	2,064,318
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	5,679	-	-	-	-	-	852	6,531	-	-	6,531	-	-	-	-	-	-	79,426	-
5b.1.1.2	Administration	-	96	-	-	-	-	-	14	111	-	-	111	-	-	-	-	-	-	2,092	-
5b.1.1.3	Auxiliary	-	4,249	-	-	-	-	-	637	4,886	-	-	4,886	-	-	-	-	-	-	61,157	-
5b.1.1.4	Chlorination (CW Intake)	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	443	-
5b.1.1.5	Chlorination (SW Intake)	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	141	-
5b.1.1.6	Circ Water Intake	-	1,322	-	-	-	-	-	198	1,520	-	-	1,520	-	-	-	-	-	-	17,143	-
5b.1.1.7	Circ Water Yard Piping	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	36	-
5b.1.1.8	Diesel Generator	-	605	-	-	-	-	-	91	695	-	-	695	-	-	-	-	-	-	8,908	-
5b.1.1.9	Maintenance	-	198	-	-	-	-	-	30	227	-	-	227	-	-	-	-	-	-	4,321	-
5b.1.1.10	Megawatt Support Ctr & Material Staging	-	331	-	-	-	-	-	50	381	-	-	381	-	-	-	-	-	-	7,669	-
5b.1.1.11	Miscellaneous Site Structures	-	8,910	-	-	-	-	-	1,336	10,246	-	-	10,246	-	-	-	-	-	-	174,325	-
5b.1.1.12	Radwaste Warehouse	-	214	-	-	-	-	-	32	246	-	-	246	-	-	-	-	-	-	5,675	-
5b.1.1.13	Safeguard	-	2,051	-	-	-	-	-	308	2,358	-	-	2,358	-	-	-	-	-	-	30,287	-
5b.1.1.14	Service Water Intake Structure	-	521	-	-	-	-	-	78	599	-	-	599	-	-	-	-	-	-	7,175	-
5b.1.1.15	Switchgear	-	113	-	-	-	-	-	17	130	-	-	130	-	-	-	-	-	-	2,049	-
5b.1.1.16	Switchyard Relay House	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	451	-
5b.1.1.17	Tanks & Tunnels	-	929	-	-	-	-	-	139	1,068	-	-	1,068	-	-	-	-	-	-	15,724	-
5b.1.1.18	Turbine	-	550	-	-	-	-	-	82	632	-	-	632	-	-	-	-	-	-	11,258	-
5b.1.1.19	Turbine Pedestal	-	1,188	-	-	-	-	-	178	1,366	-	-	1,366	-	-	-	-	-	-	15,907	-
5b.1.1.20	Fuel	-	4,201	-	-	-	-	-	630	4,831	-	-	4,831	-	-	-	-	-	-	59,867	-
5b.1.1	Totals	-	31,213	-	-	-	-	-	4,682	35,895	-	-	35,895	-	-	-	-	-	-	504,053	-
Site Closeout Activities																					
5b.1.2	Backfill Site	-	2,643	-	-	-	-	-	396	3,039	-	-	3,039	-	-	-	-	-	-	6,414	-
5b.1.3	Grade & landscape site	-	477	-	-	-	-	-	72	549	-	-	549	-	-	-	-	-	-	1,292	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	82	12	94	94	-	-	-	-	-	-	-	-	-	668
5b.1	Subtotal Period 5b Activity Costs	-	34,332	-	-	-	-	82	5,162	39,577	94	-	39,482	-	-	-	-	-	-	511,759	668
Period 5b Additional Costs																					
5b.2.1	Concrete Processing	-	1,521	-	-	-	-	6	229	1,757	-	-	1,757	-	-	-	-	-	-	7,139	-
5b.2.2	Circulating Water Cofferdam	-	428	-	-	-	-	-	64	492	-	-	492	-	-	-	-	-	-	3,894	-
5b.2.3	Service Water Cofferdam	-	409	-	-	-	-	-	61	471	-	-	471	-	-	-	-	-	-	3,725	-
5b.2.4	ISFSI Demolition and Site Restoration	-	724	-	-	-	-	25	112	860	-	860	-	-	-	-	-	-	-	14,350	80
5b.2	Subtotal Period 5b Additional Costs	-	3,082	-	-	-	-	31	467	3,580	-	860	2,720	-	-	-	-	-	-	29,108	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	316	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	-	-

Table D-2
Comanche Peak Nuclear Power Plant, Unit 2
SAFSTOR Decommissioning Cost Estimate
(thousands of 2009 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
5b.3	Subtotal Period 5b Collateral Costs	-	316	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	*Property taxes*	-	-	-	-	-	-	180	18	198	-	-	198	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,136	-	-	-	-	-	920	7,056	-	-	7,056	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	241	36	277	-	-	277	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	980	147	1,127	-	-	1,127	-	-	-	-	-	-	-	27,581
5b.4.6	DOC Staff Cost	-	-	-	-	-	-	7,431	1,115	8,546	-	-	8,546	-	-	-	-	-	-	-	110,240
5b.4.7	Utility Staff Cost	-	-	-	-	-	-	3,481	522	4,003	-	-	4,003	-	-	-	-	-	-	-	54,080
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,136	-	-	-	-	12,313	2,758	21,207	-	-	21,207	-	-	-	-	-	-	-	191,901
5b.0	TOTAL PERIOD 5b COST	-	43,866	-	-	-	-	12,426	8,435	64,727	94	860	63,772	-	-	-	-	-	-	540,867	192,649
PERIOD 5 TOTALS		-	43,866	-	-	-	-	12,426	8,435	64,727	94	860	63,772	-	-	-	-	-	-	540,867	192,649
TOTAL COST TO DECOMMISSION		11,501	100,197	8,765	4,047	24,589	34,792	469,036	111,206	764,134	574,830	118,908	70,396	259,998	102,201	3,330	470	505	18,446,680	1,654,561	6,133,645

TOTAL COST TO DECOMMISSION WITH 17.03% CONTINGENCY:	$764,134	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 75.23% OR:	$574,830	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 15.56% OR:	$118,908	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 9.21% OR:	$70,396	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	105,001	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	94,995	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,654,561	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