Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

Exelon Nuclear

10 CFR 50.75(f)(1)

RS-10-009

January 11, 2010

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Subject: Submittal of Braidwood Station Site-Specific SAFSTOR Decommissioning Cost Estimate

Reference: Letter from Keith R. Jury (Exelon Generation Company) to U.S. NRC, "Decommissioning Funding Assurance Plan," dated July 29, 2009

In the referenced letter, Exelon Generation Company, LLC (EGC) committed to provide a site-specific SAFSTOR Decommissioning Cost Estimate (DCE) for Braidwood Station, Units 1 and 2. The DCE is provided as Attachment 1, and, in accordance with 10 CFR 50.75(b)(1), is greater than the amount specified in 10 CFR 50.75(c) for both Unit 1 and Unit 2. The DCE has been performed assuming that Braidwood Station, Units 1 and 2 are granted license extension, since it is intended to reflect the most likely decommissioning scenario for Braidwood Station. However, this determination of the minimum funding requirement does not credit the additional 20-year license renewal period.

Attachment 2 shows the radiological decommissioning (license termination) cash flow based on the DCE in Attachment 1, assuming the SAFSTOR scenario, and does not include the costs of dismantling non-radiological systems and structures or the cost of managing and storing spent fuel onsite. EGC has not made a final determination of the decommissioning approach for Braidwood Station. For the purpose of choosing a decommissioning option to demonstrate adequacy of funding to meet regulatory requirements, the SAFSTOR option has been selected. EGC may choose a different decommissioning option in the future, recognizing that the chosen option must meet NRC requirements for decommissioning funding.

The costs presented in Attachment 2 occur 20 years earlier than those in the Attachment 1 DCE to model the current license expiration date. No credit is taken for license renewal. The cash flow analysis assumes a 2% annual real rate of return on trust fund dollars until plant shutdown and on remaining trust fund dollars through the decommissioning period. The site-specific estimate is based on a period of safe storage specifically described in the Attachment 1 DCE. The Attachment 1 DCE presents the results in 2009 dollars. These results are escalated to December 31, 2009 by using the latest site-specific escalation factor, which is re-calculated on an annual basis.

For Braidwood Station Units 1 and 2, the decommissioning funding assurance is provided by the prepayment method, coupled with an external trust fund, in accordance with 10 CFR 50.75(e)(1)(i). There are no additional amounts to be collected from ratepayers for Braidwood Station, nor are there any contracts relied upon to pursuant to 10 CFR 50.75(e)(1)(v).

Per the referenced letter, EGC will perform a calculation of radiological decommissioning funding assurance as of December 31, 2009 based on this site-specific SAFSTOR estimate. If this calculation does not show adequate decommissioning funding assurance, EGC will obtain approval from the EGC Board of Directors for, and establish an additional funding assurance mechanism by April 1, 2010.

There are no new regulatory commitments contained in this letter.

If you have any questions about this letter, please contact me at (630) 657-2823.

Respectfully,

Patrick R. Simpson
Manager – Licensing
Exelon Generation Company, LLC

Attachments: 1. Braidwood Station, Units 1 and 2, Decommissioning Cost Estimate
2. Braidwood Station, Units 1 and 2, Radiological Decommissioning Projected SAFSTOR Cash Flow

ATTACHMENT 1

Braidwood Station, Units 1 and 2
Decommissioning Cost Estimate

Document E16-1555-014, Rev. 0

DECOMMISSIONING COST ANALYSIS

for the

BRAIDWOOD NUCLEAR POWER STATION

prepared for

Exelon Generation Company LLC

prepared by

TLG Services, Inc.
Bridgewater, Connecticut

October 2009

APPROVALS

Project Manager	William A. Cloutier, Jr.	10/27/2009 Date
Project Engineer	John A. Carlson	10/27/09 Date
Technical Manager	Francis W. Seymore	10/27/09 Date

TABLE OF CONTENTS

SECTION **PAGE**

EXECUTIVE SUMMARY ..... vii-xviii

1. INTRODUCTION 1-1
1.1 Objectives of Study 1-1
1.2 Site Description 1-1
1.3 Regulatory Guidance 1-2
1.3.1 Nuclear Waste Policy Act 1-4
1.3.2 Low-Level Radioactive Waste Acts 1-6
1.3.3 Radiological Criteria for License Termination 1-7

2. DECOMMISSIONING ALTERNATIVES 2-1
2.1 DECON 2-2
2.1.1 Period 1 - Preparations 2-2
2.1.2 Period 2 - Decommissioning Operations 2-4
2.1.3 Period 3 - Site Restoration 2-8
2.1.4 ISFSI Operations and Decommissioning 2-9
2.2 SAFSTOR and DELAYED DECON 2-9
2.2.1 Period 1 - Preparations 2-10
2.2.2 Period 2 - Dormancy 2-11
2.2.3 Periods 3 and 4 - Delayed Decommissioning 2-12
2.2.4 Period 5 - Site Restoration 2-13

3. COST ESTIMATE 3-1
3.1 Basis of Estimate 3-1
3.2 Methodology 3-1
3.3 Plant Inventory 3-3
3.3.1 Plant Systems 3-3
3.3.2 Plant Structures 3-3
3.4 Impact of Decommissioning Multiple Reactor Units 3-4
3.5 Financial Components of the Cost Model 3-5
3.5.1 Contingency 3-5
3.5.2 Financial Risk 3-8
3.6 Site-Specific Considerations 3-9
3.6.1 Spent Fuel Management 3-9
3.6.2 Reactor Vessel and Internal Components 3-12
3.6.3 Primary System Components 3-13
3.6.4 Main Turbine and Condenser 3-14

TABLE OF CONTENTS
(continued)

SECTION **PAGE**

3.6.5 Transportation Methods 3-14
3.6.6 Low-Level Radioactive Waste Disposal 3-15
3.6.7 Site Conditions Following Decommissioning 3-16
3.7 Assumptions 3-17
3.7.1 Estimating Basis 3-17
3.7.2 Labor Costs 3-17
3.7.3 Design Conditions 3-18
3.7.4 General 3-18
3.8 Cost Estimate Summary 3-20

4. SCHEDULE ESTIMATE 4-1
4.1 Schedule Estimate Assumptions 4-1
4.2 Project Schedule 4-2

5. RADIOACTIVE WASTES 5-1

6. RESULTS 6-1

7. REFERENCES 7-1

TABLES

Summary of Decommissioning Cost Elements, DECON xvi
Summary of Decommissioning Cost Elements, Delayed DECON xvii
Summary of Decommissioning Cost Elements, SAFSTOR xviii
3.1a Schedule of Total Annual Expenditures, DECON Unit 1 3-21
3.1b Schedule of Total Annual Expenditures, DECON Unit 2 3-22
3.2a Schedule of Total Annual Expenditures, Delayed DECON Unit 1 3-23
3.2b Schedule of Total Annual Expenditures, Delayed DECON Unit 2 3-24
3.3a Schedule of Total Annual Expenditures, SAFSTOR Unit 1 3-25
3.3b Schedule of Total Annual Expenditures, SAFSTOR Unit 2 3-28
5.1 Decommissioning Waste Summary, DECON 5-3
5.2 Decommissioning Waste Summary, Delayed DECON 5-4
5.3 Decommissioning Waste Summary, SAFSTOR 5-5
6.1 Summary of Decommissioning Cost Elements, DECON 6-4
6.2 Summary of Decommissioning Cost Elements, Delayed DECON 6-5
6.3 Summary of Decommissioning Cost Elements, SAFSTOR 6-6

TABLE OF CONTENTS
(continued)

SECTION **PAGE**

FIGURES

4.1 DECON Activity Schedule 4-3
4.2 Decommissioning Timeline, DECON 4-5
4.3 Decommissioning Timeline, Delayed DECON 4-6
4.4 Decommissioning Timeline, SAFSTOR 4-7

APPENDICES

A. Unit Cost Factor Development A-1
B. Unit Cost Factor Listing B-1
C. Detailed Cost Analysis, DECON C-1
D. Detailed Cost Analysis, Delayed DECON D-1
E. Detailed Cost Analysis, SAFSTOR E-1

REVISION LOG

No.	CRA No.	Date	Item Revised	Reason for Revision
0		10-27-2009		Original Issue

EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission the Braidwood Nuclear Power Station (Braidwood) for the identified decommissioning scenarios following a scheduled cessation of plant operations. The analysis relies upon site-specific, technical information, developed in an evaluation in 2004,[1] and updated to reflect current assumptions pertaining to the disposition of the nuclear units and relevant industry experience in undertaking such projects. Additionally, the plant systems inventory was completely regenerated from the Byron Nuclear Power Station's site-specific database. This is appropriate since Byron and Braidwood are essentially identical in design and vintage. Byron's plant systems inventory was subsequently modified to reflect design features unique to Braidwood. The updated estimates are designed to provide Exelon Generation Company LLC (Exelon) with sufficient information to assess its financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the plant's operating licenses can be terminated. The analysis recognizes that spent fuel will be stored at the site in the plant's storage pool and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to a Department of Energy (DOE) facility. Consequently, the estimates also include those costs to manage and subsequently decommission the fuel storage facilities.

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 of approximately five and one-half years for the spent fuel in the storage pool at the cessation of Unit 2 operations. In the DECON and SAFSTOR scenarios, any residual fuel remaining in the pool after the cooling period is relocated to the ISFSI to await transfer to a DOE facility (the fuel is assumed to remain in the storage pool for the Delayed DECON scenario and transferred directly from the pool to DOE). The estimates also include the dismantling of non-essential structures and limited restoration of the site.

---

1 "Decommissioning Cost Analysis for the Braidwood Nuclear Power Station," Document No. E16-1455-013, Rev. 0, TLG Services, Inc., January 2005

Alternatives and Regulations

The Nuclear Regulatory Commission (NRC or Commission) 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.
>
> The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become

---

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 FR24022, Column 3

4 Ibid.

5 Ibid. Page FR24023, Column 2

a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities) at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In 1996, the NRC amended its decommissioning regulations 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 amendments 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]

Decommissioning Scenarios

The following scenarios were evaluated and are representative of the alternatives available to the owner. The scenarios assume that the units operate for 60 years, followed by a planned and scheduled shutdown.

1. DECON: The first scenario assumes that the two units are promptly decommissioned as an integrated activity. Spent fuel is relocated from the wet storage pool to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling building. Spent fuel storage operations continue at the site, independent of decommissioning operations, until the transfer of the fuel to the DOE is complete, assumed for purposes of this study to be in the year 2065. At that time, the ISFSI is decommissioned and the site released for alternative use.

2. Delayed DECON: In the second scenario, the units are prepared for an abbreviated period of safe-storage. The spent fuel resident in the fuel handling building's storage pool, remains in the pool until it can be transferred to the

6 U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," NRC, 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

DOE (i.e., the ISFSI is not used to off-load the pool following the cessation of operations). Spent fuel placed at the ISFSI during operations remains in storage until the pool is emptied at which time the ISFSI is also emptied. Decommissioning is scheduled to commence once the transfer of the fuel to the DOE is complete (i.e., in the year 2065).

3. SAFSTOR: The units are also placed into safe-storage in the third scenario. However, decommissioning is deferred beyond the fuel storage period to the maximum extent permitted by the current regulations. Similar to the DECON alternative, the spent fuel in the wet storage pool is relocated to the ISFSI for interim storage. The units remain in protective storage following the removal of spent fuel from the site. Decommissioning operations commence such that license termination is completed within the required 60-year period. As with the first two scenarios, decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling process.

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.

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 cost estimate.

Contingency

Consistent with standard cost estimating practice, contingencies are applied to the decontamination and dismantling costs 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

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

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 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 station.

The use and role of contingency within decommissioning estimates is not a safety factor issue. Safety factors provide additional security and address situations that may never occur. Contingency funds, by contrast, are expected to be fully expended throughout the program. 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.

Until recently, there were two facilities available to Exelon for the disposal of low-level radioactive waste generated by Braidwood. 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 available destination for low-level radioactive waste requiring controlled disposal.

EnergySolutions does not have a license to dispose of the more highly radioactive waste (Class B and C as defined by 10 CFR §61) generated in the decontamination and dismantling of the reactor vessel. In the interim (at least until new waste disposal options become available) and for purposes of this analysis, waste disposal costs for this material are based upon Exelon's previously negotiated cost of disposal at the Barnwell site.

---

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

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

Material exceeding Class C limits (limited to material closest to the reactor core and comprising a small percentage of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multipurpose canisters used for spent fuel storage/transport and designated for geologic disposal.

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

High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" [12] (NWPA) in 1982, assigning the responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. Two permanent disposal facilities were envisioned, as well as an interim storage facility. To recover the cost, the legislation created a Nuclear Waste Fund through which money is collected from the sale of electricity generated by the power plants. The NWPA, along with the individual disposal 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 initiate the disposal of spent nuclear fuel and high level waste, as required by the NWPA and the utility contracts. As a result, utilities initiated legal action against the DOE. While legal actions continue, the DOE has no plans to receive spent fuel prior to completing the construction of its geologic repository.

Operation of DOE's yet-to-be constructed repository is contingent upon the review and approval of the facility's license application by the NRC and the successful resolution of pending litigation. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. The NRC formally docketed the DOE's license application on September 8, 2008, triggering a three-year deadline, with a possible one-year

---

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

extension, set by Congress for the NRC to decide on whether to authorize construction.

Construction, if adequately funded, could take five to six years after the DOE receives authorization to proceed. For purposes of this analysis, Exelon has assumed that DOE would begin to receive commercial spent fuel in 2018.

Once the repository is operational, fuel acceptance will be prioritized and spent fuel assemblies will need to meet certain acceptance criteria, including heat output. These conditions require that the fuel discharged upon the cessation of operations be actively cooled and stored for a minimum period at the generating site prior to transfer (a minimum of five years as defined in 10CFR§961 for standard fuel). 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 until title of the fuel is transferred to the Secretary of Energy, pursuant to 10CFR§50.54(bb).[13] This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the plant's fuel storage pool and/or ISFSI.

At shutdown, the plant's storage pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor cores. In the DECON and SAFSTOR scenarios the assemblies are packaged into multipurpose canisters for transfer to an existing ISFSI. A five and one-half year cooling period following the cessation of Unit 2 operations is provided for the final core to meet the conditions for dry storage.

Once the storage pool is emptied, the fuel handling building can be either decontaminated and dismantled or prepared for long-term storage. The ISFSI, which can be operated under the station's general license, will be expanded to accommodate the dry storage casks needed to off-load the wet storage pool. In the Delayed DECON scenario, the storage pool remains operational and used for the interim storage of the fuel. No additional dry storage capacity is assumed to be constructed for decommissioning. The transfer of spent fuel to DOE is performed first from the storage pool and is completed from the ISFSI.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. With a large fleet of reactors, Exelon is able to re-assign allocations between its units to minimize on-site storage costs. Assuming spent fuel from the older units is given priority and with a maximum rate of

---

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

transfer of 3,000 metric tons of uranium (MTU)/year), the assemblies residing in the Braidwood storage pool at the time of shutdown would be scheduled for pickup in the years 2061 through 2065 (assuming the cessation of plant operations in 2046 and 2047 for Units 1 and 2, respectively). This equates to 93 multi-purpose canisters (at 32 assemblies per canister), in addition to the 26 on the pad from operations.

Exelon's strongly held position is that the DOE has a contractual obligation to accept Braidwood's fuel in a timely manner and 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.

Site Restoration

The efficient removal of the contaminated materials at the site will 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 demolition once the license is terminated 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 is more efficient and less costly than if the process were deferred. Experience at shutdown generating stations has shown that plant facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and the demolition work force. Consequently, this analysis assumes that non-essential site structures within the restricted access area are removed to a nominal depth of three feet below the local grade level wherever possible. The site is then graded and stabilized.

Summary

The costs to decommission Braidwood were evaluated for several decommissioning scenarios, incorporating the attributes of both the DECON and SAFSTOR decommissioning alternatives. Regardless of the timing of the decommissioning activities, the estimates assume the eventual removal of all the contaminated and activated plant components and structural materials, such that the facility operator may then have unrestricted use of the site with no further requirement for an operating license. Delayed decommissioning is initiated after the spent fuel has been removed from the site and 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 can be completed. Once the transfer is complete, the storage facilities are also decommissioned.

The scenarios analyzed for the purpose of generating the estimates 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, D, and E. Cost summaries for the various scenarios are provided at the end of this section for the major cost components.

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

Cost Element	Unit 1	Unit 2	Total
Decontamination	14,448	21,998	36,446
Removal	104,588	144,778	249,366
Packaging	15,773	14,220	29,993
Transportation	11,326	9,460	20,786
Waste Disposal	60,720	58,964	119,684
Off-site Waste Processing	3,959	4,151	8,110
Program Management [1]	266,127	325,124	591,251
Spent Fuel Pool Isolation	0	11,143	11,143
Spent Fuel Management [2]	82,444	81,847	164,291
Insurance and Regulatory Fees	12,512	11,019	23,532
Energy	8,640	9,062	17,702
Characterization and Licensing Surveys	17,727	15,561	33,288
Property Taxes	19,878	19,235	39,113
Miscellaneous Equipment	6,307	6,614	12,921
Site O&M	2,838	2,670	5,508
Total [3]	627,287	735,847	1,363,134

Cost Element			
NRC License Termination	442,250	528,878	971,127
Spent Fuel Management	119,415	118,817	238,232
Site Restoration	65,622	88,152	153,775
Total [3]	627,287	735,847	1,363,134

[1] Includes security and 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

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

Cost Element	Unit 1	Unit 2	Total
Decontamination	12,825	18,676	31,501
Removal	103,154	141,706	244,860
Packaging	12,150	10,566	22,717
Transportation	9,988	7,824	17,812
Waste Disposal	42,046	39,076	81,123
Off-site Waste Processing	4,467	4,999	9,465
Program Management [1]	326,717	373,992	700,709
Spent Fuel Pool Isolation	0	11,143	11,143
Spent Fuel Management [2]	26,667	27,589	54,256
Insurance and Regulatory Fees	18,427	16,527	34,954
Energy	14,505	15,114	29,619
Characterization and Licensing Surveys	19,197	17,031	36,228
Property Taxes	24,872	24,229	49,101
Miscellaneous Equipment	10,181	11,461	21,642
Site O&M	4,141	3,973	8,115
Total [3]	629,338	723,907	1,353,245

Cost Element			
NRC License Termination	424,316	511,430	935,745
Spent Fuel Management	137,704	122,649	260,353
Site Restoration	67,318	89,829	157,147
Total [3]	629,338	723,907	1,353,245

[1] Includes security and 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

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

Cost Element	Unit 1	Unit 2	Total
Decontamination	12,690	18,439	31,130
Removal	107,121	145,708	252,829
Packaging	12,086	10,470	22,556
Transportation	9,757	7,448	17,205
Waste Disposal	40,497	37,352	77,849
Off-site Waste Processing	4,528	5,060	9,589
Program Management [1]	371,647	410,241	781,887
Spent Fuel Pool Isolation	0	11,143	11,143
Spent Fuel Management [2]	80,765	80,168	160,933
Insurance and Regulatory Fees	35,717	33,338	69,055
Energy	17,975	18,489	36,464
Characterization and Licensing Surveys	19,197	17,031	36,228
Property Taxes	43,384	42,741	86,125
Miscellaneous Equipment	15,647	19,086	34,732
Site O&M	8,981	8,813	17,793
Total [3]	779,992	865,527	1,645,519

Cost Element			
NRC License Termination	598,915	654,337	1,253,252
Spent Fuel Management	113,746	121,347	235,093
Site Restoration	67,331	89,843	157,173
Total [3]	779,992	865,527	1,645,519

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

1. INTRODUCTION

This report presents estimates of the cost to decommission the Braidwood Nuclear Power Station (Braidwood), for the scenarios described in Section 2, following a scheduled cessation of plant operations. The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2004,[1] updated to reflect current assumptions pertaining to the disposition of the nuclear units and relevant industry experience in undertaking such projects. Additionally, the plant systems inventory was completely regenerated from the Byron Nuclear Power Station's site-specific database. This is appropriate since Byron and Braidwood are essentially identical in design and vintage. Byron's plant systems inventory was subsequently modified to reflect design features unique to Braidwood. The current estimates are designed to provide Exelon Generation Company LLC (Exelon), with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear units. 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

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the cost to decommission Braidwood, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities. Operating licenses were issued on October 17, 1986, for Unit 1 and December 18, 1987, for Unit 2. A sixty year operating lifetime has been assumed for the purpose of this study. As such, the cessation of operations would then be October 17, 2046, for Unit 1 and December 18, 2047, for Units 1 and 2, respectively. These dates were used to schedule the decommissioning activities.

1.2 SITE DESCRIPTION

Braidwood is located near the Kankakee River, approximately 6 line miles southwest of Wilmington, Illinois. The station is comprised of two essentially identical pressurized water reactors with supporting facilities.

The primary coolant system for each unit consists of a pressurized water reactor system designed by the Westinghouse Corporation. The reactor coolant system is comprised of the reactor vessel and four heat transfer loops. Each loop contains a reactor coolant pump, steam generator, and associated piping and valves. In addition, the system includes a pressurizer, a pressurizer relief

tank, interconnected piping, and the instrumentation necessary for operational control. All components of the reactor coolant system are located in the containment building. The design reactor thermal power level is 3,587 Megawatts thermal (MWth). The corresponding electrical outputs are approximately 1,178 Megawatts electric (MWe) and 1152 MWe for Units 1 and 2, respectively.

The containment structure at Braidwood Station is a prestressed concrete shell structure made up of a cylinder with a shallow dome roof and a flat foundation slab. The entire structure is lined on the inside with steel plate, which acts as a leaktight membrane. The containment completely encloses the entire primary coolant system, including portions of the auxiliary and engineered safety features systems.

Heat produced in the reactor is converted to electrical energy by the power conversion system. A turbine-generator system converts the thermal energy of steam produced in the reactor into mechanical shaft power and then into electrical energy. The main turbine consists of one double-flow, high-pressure turbine and three double-flow, low-pressure turbines. The generator is driven at 1800 rpm and is rated at 1300 MVA. The exhaust steam from the turbine is condensed and deaerated in the main condenser. The heat rejected to the main condenser is removed by the circulating water system.

The circulating water system provides the heat sink required for removal of waste heat in the power plant's thermal cycle. The system has the principal function of removing heat by absorbing this energy in the main condenser. Water is withdrawn from a cooling lake by the circulating water pumps via the intake pipes. After passing through the plant condensers, the discharge is routed back to the cooling lake.

1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.[2]* This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose.

* Annotated references for citations in Sections 1-6 are provided in Section 7.

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 recent rulemaking permitting the controlled release of a site, the NRC has re-evaluated this alternative.[4] 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] However, the NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities, at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

The NRC published amendments to its decommissioning regulations in 1996.[6] When the regulations were originally adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The new 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 applications 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 responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. Two permanent disposal facilities were envisioned, as well as an interim storage facility. To recover the cost, the legislation created a Nuclear Waste Fund through which money is collected from the sale of electricity generated by the power plants. NWPA, along with the individual disposal 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 initiate the disposal of spent nuclear fuel and 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 resolve the impasse.[8]

Operation of DOE's yet-to-be constructed repository is contingent upon the review and approval of the facility's license application by the NRC and the successful resolution of pending litigation. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. The NRC formally docketed the DOE's license application on September 8, 2008, triggering a three-year deadline, with a possible one-year extension, set by Congress for the NRC to decide on whether to authorize construction.

Construction, if adequately funded, could take five to six years after the DOE receives authorization to proceed. For purposes of this analysis, Exelon has assumed that DOE would begin to receive commercial spent fuel in 2018.

Once the repository is operational, fuel acceptance will be prioritized and spent fuel assemblies will need to meet certain acceptance criteria, including heat output. These conditions require that the fuel discharged upon the cessation of operations be actively cooled and stored for a minimum period at the generating site prior to transfer (five years as defined in 10CFR§961 for standard fuel). 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 until title of the fuel is transferred to the Secretary of Energy, pursuant to 10CFR§50.54(bb).[9] This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimate, for example, associated with the isolation and continued operation of the spent fuel pool and ISFSI.

At shutdown, the fuel storage pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core. Over the next five and one-half years (from the cessation of Unit 2 operations) the assemblies are packaged into multipurpose canisters for transfer to the ISFSI. It is assumed that this period provides the necessary cooling for the final core to meet on site storage system requirements for decay heat.

An independent spent fuel storage installation (ISFSI) has been constructed to support plant operations. It is expected that this facility will also be available to support decommissioning operations. In two of the scenarios evaluated, the ISFSI is expanded to accommodate the inventory

of spent fuel residing in the plant's storage pool at the conclusion of the required cooling period. Once emptied, the fuel handling building can be either decontaminated and dismantled or prepared for long-term storage. In the Delayed DECON scenario, the storage pool remains operational and is used for the interim storage of the fuel, concurrent with the ISFSI operations.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. For purposes of this analysis, the acceptance of commercial spent fuel by the DOE is expected to begin in 2018. Given this scenario and an anticipated rate of transfer, spent fuel is projected to remain at the Braidwood site for approximately 18 years after the cessation of operations at Unit 2. Consequently, costs are included within the analysis for the continued operation of the storage pool and the expansion of the ISFSI, as required, and for the long-term caretaking of the spent fuel at the site until the year 2065.

Exelon's strongly held position is that the DOE has a contractual obligation to accept Braidwood's fuel in a timely manner and 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.

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. Congress passed the "Low-Level Radioactive Waste Policy Act" in 1980,[10] declaring the states as being ultimately responsible for the disposition of low-level radioactive waste generated within their own borders. The federal law encouraged the formation of regional groups or compacts to implement this objective safely, efficiently, and economically, and set a target date of 1986 for implementation. After little progress, the "Low-Level Radioactive Waste Policy Amendments Act of 1985,"[11] extended the implementation schedule, with specific milestones and stiff sanctions for non-compliance. However, to date, no new compact facilities have been successfully sited, licensed, and constructed.

Until recently, there were two facilities available to Exelon for the disposal of low-level radioactive waste generated by Braidwood. 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 available destination for low-level radioactive waste requiring controlled disposal.

EnergySolutions does not have a license to dispose of the more highly radioactive waste (Class B and C as defined by 10 CFR §61) generated in the dismantling of the reactor vessel. In the interim (at least until new waste disposal options become available) and for purposes of this analysis, waste disposal costs for this material are based upon Exelon's previously negotiated cost of disposal at the Barnwell site.

Material exceeding Class C limits (limited to material closest to the reactor core and comprising a small percentage of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multipurpose canisters used for spent fuel storage/transport and designated for geologic disposal.

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

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"[12] amending 10 CFR §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 for Braidwood assume that the 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 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 Braidwood for three variations of the approved decommissioning alternatives: DECON and SAFSTOR. Although the scenarios differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

The following scenarios were evaluated and are representative of the alternatives available to the owner. The scenarios assume that the units operate for 60 years, followed by a planned and scheduled shutdown.

1. DECON: The first scenario assumes that the two units are promptly decommissioned as an integrated activity. Spent fuel in the wet storage pool is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling building. Spent fuel storage operations continue at the site, independent of decommissioning operations, until the transfer of the fuel to the DOE is complete, assumed for purposes of this study to be in the year 2065. At that time, the ISFSI is decommissioned and the site released for alternative use.

2. Delayed DECON: In the second scenario, the units are prepared for an abbreviated period of safe-storage. The spent fuel resident in the fuel handling building's storage pool, remains in the pool until it can be transferred to the DOE (i.e., the ISFSI is not used to off-load the pool following the cessation of operations). Spent fuel placed at the ISFSI during operations remains in storage until the pool is emptied at which time the ISFSI is also emptied. Decommissioning is scheduled to commence once the transfer of the fuel to the DOE is complete (i.e., in the year 2065).

3. SAFSTOR: The units are also placed into safe-storage in the third scenario. However, decommissioning is deferred beyond the fuel storage period to the maximum extent permitted by the current regulations. Similar to the DECON alternative, the spent fuel in the wet storage pool is relocated to the ISFSI for interim storage. The units remain in protective storage following the removal of spent fuel from the site. Decommissioning operations commence such that license termination is completed within the required 60-year period. As with the first two scenarios, decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling process.

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 facilitate 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 would then be 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 Braidwood 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 meeting to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

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

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

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as

defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, and 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 biological shield cores.
- Isolation of the spent fuel storage pool and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. Decommissioning operations are scheduled around the fuel handling areas to optimize the overall project schedule. The fuel is transferred to the ISFSI as it decays to the point that it meets the heat load criteria of the containers. Consequently, it is assumed that the fuel pool remains operational for approximately five and one-half years following the cessation of Unit 2 operations.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful 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. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks (i.e., by weight and activity). The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core 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 steam generator cubicles necessary for access and component extraction are removed.
- Removal of the steam generators and pressurizer for material recovery and controlled 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 lightweight grout). Steel shielding is added, as necessary, to those external areas of the package to meet transportation limits and regulations.
- Transfer of the spent fuel from the storage pool to the ISFSI pad for interim storage.
- Expansion of the ISFSI and transfer of the spent fuel from the storage pool to the ISFSI pad for interim storage. Spent fuel storage operations continue throughout the active decommissioning period. Fuel transfer is expected to begin in 2061 and to be completed by the end of the year 2065.

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 meeting. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).

- Removal of the steel liners from the 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 structures.
- Removal of the contaminated equipment and material from the auxiliary and fuel buildings, and any other contaminated facility. Use radiation and contamination control techniques until radiation surveys 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 will facilitate surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Removal of the remaining components, equipment, and plant services in support of the area release survey(s).
- 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 when 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 and auxiliary 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.

Concrete rubble produced by demolition activities is processed to remove rebar and miscellaneous embedments. The processed material is then used on site to backfill voids. Excess 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 the general license provisions of 10 CFR §72 following the termination of the §50 operating license. Assuming the DOE starts accepting fuel in 2018, transfer of spent fuel from Braidwood is anticipated to begin in 2061 and continue through the year 2065.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission 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.

The assumed design for the ISFSI is based upon the use of a multi-purpose canister and a concrete overpack for pad storage. 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, and the license for the facility terminated, the modules can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pad will then be removed, and the area graded and landscaped to conform to the surrounding environment.

2.2 SAFSTOR and DELAYED DECON

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 not required to operate in support of the spent fuel pool 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 are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative. 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.

The following discussion is appropriate for both the SAFSTOR and Delayed DECON scenarios, the primary differences being in the length of the dormancy period. In the Delayed DECON scenario, the fuel remains in the fuel handling building's storage pool until such time that the transfer to a DOE facility is complete. Decommissioning operations are assumed to begin once fuel is off site. By contrast, in the SAFSTOR scenario, the spent fuel is relocated to the ISFSI. The plant remains in safe-storage even after the fuel is removed from site. Decommissioning operations are initiated such that the license is terminated within the required 60-year time period.

2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactors, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

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

- Isolation of the spent fuel storage services and fuel handling systems located in the fuel handling building 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.
- 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 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 their own actions. The security fence, sensors, alarms, and other surveillance equipment provide security. Fire and radiation alarms are also monitored and maintained. While remote surveillance is an option, it does not offer the immediate response time of a physical presence.

The transfer of the spent fuel to a DOE facility continues during this period until complete. Fuel is shipped exclusively from the ISFSI in the SAFSTOR scenario and from both the pool and the ISFSI in the Delayed DECON scenario.

After an optional period of storage (such that license terminations are accomplished within 60 years of final shutdown), it is required that the licensee submit applications 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 deferred scenarios is the absence, in the latter, of any constraint on the availability of the fuel storage facilities located within the fuel handling building 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 sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone (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 the delayed scenarios incorporate reduced ALARA controls for the 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 deferred scenarios. Portions of the biological shield will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities can begin. If the site structures are to be dismantled, 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 the deferred scenarios is consistent with that described for DECON, removal of structures and site facilities to a nominal depth of three feet below grade and limited restoration of the site.

3. COST ESTIMATE

The cost estimates prepared for decommissioning Braidwood 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 with site-specific, technical information developed in an evaluation prepared for Exelon in 2004. The 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) were developed using local labor rates. The activity-dependent costs were 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 relied upon information available in the industry publication, "Building Construction Cost Data," published by R.S. Means.[19]

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.

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.

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 were 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 40%
- 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 are 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 cost estimate.

3.3 PLANT INVENTORY

The basis for any site-specific decommissioning estimate is the plant inventory. The inventory dictates the decontamination, removal, packaging, transport and disposal requirements and the associated performance cost. Material disposition requirements impact the project schedule and are reflected in the level of management needed to support the project. Consequently, it is important to delineate the inventory of material and components to be dispositioned during decommissioning, which in most instances is a subset of the total quantity of material placed during construction. In addition, the plant inventory needs to be defined in units that are compatible with the intended removal methods. For example, while sample panels may contain hundreds of subassemblies, the panels are removed in bulk. The disposition cost may be based upon the total weight of the panel and the lifting devices required rather than by disassembly of the individual components. In contrast to plant operations, the most important parameter in decommissioning can be the component's mass or materials of construction and not its design performance.

3.3.1 Plant Systems

The plant systems inventory was completely regenerated from the Byron Nuclear Power Station's site-specific database that was developed in 2009. This is appropriate since Byron and Braidwood are essentially identical in design and vintage. Byron's plant systems inventory was subsequently modified to reflect design features unique to Braidwood. Where new information was not available, the basis for the previous estimate was reviewed and, once validated, used to supplement the new inventory.

3.3.2 Plant Structures

Structure inventories for the major power block structures relied upon the data from the 2004 study. A site inspection conducted in 2009 identified new buildings and security improvements at the site since the previous study was performed. These structures and site improvements were incorporated into the current estimate.

3.4 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 estimate, 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 immediately 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 estimate is 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 pool and subsequent decontamination of the fuel handling 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.

3.5 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.

3.5.1 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, a contingency factor has been applied. 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.

The use and role of contingency within decommissioning estimates is not a "safety factor issue." Safety factors provide additional security and address situations that may never occur. Contingency funds are expected to be fully expended throughout the program. They also provide assurance that sufficient funding is available to accomplish the intended tasks. An estimate without contingency, or from which contingency has been removed, can disrupt the orderly progression of events and jeopardize a successful conclusion to the decommissioning process.

For example, the most technologically challenging task in decommissioning a commercial nuclear station is the disposition of the reactor vessel and internal components, now highly radioactive after a lifetime of exposure to core activity. The disposition of these components forms the basis of the critical path (schedule) for decommissioning operations. Cost and schedule are interdependent, and any deviation in schedule has a significant impact on cost for performing a specific activity.

Disposition of the reactor vessel internals involves the underwater cutting of complex components that are highly radioactive. Costs are based upon optimum segmentation, handling, and packaging scenarios. The schedule is primarily dependent upon the turnaround time for the heavily shielded shipping casks, including preparation, loading, and decontamination of the containers for transport. The number of casks required is a function of the pieces generated in the segmentation activity, a value calculated on optimum performance of the tooling employed in cutting the various subassemblies. The expected optimization, however, may not be achieved, resulting in delays and additional program costs. For this reason, contingency must be included to mitigate the consequences of the expected inefficiencies inherent in this complex activity, along with related concerns associated with the operation of highly specialized tooling, field conditions, and water clarity.

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 estimate. For example, the composite contingency values reported for the DECON alternative are 18.3% and 18.2% for Units 1 and 2, respectively. Values for the other alternatives are delineated within the detailed cost tables in Appendices D and E.

3.5.2 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 (e.g., 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, in the start and rate of acceptance of spent fuel by the DOE).
- Pricing changes for basic inputs, such as labor, energy, materials, and burial.

This cost study does not add any additional cost 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 estimate.

3.6 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 impacts of the considerations identified below are included in this cost study.

3.6.1 Spent Fuel Management

The cost to dispose of spent fuel generated from plant operations is not reflected within the estimates to decommission the Braidwood site. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the NWPA. 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 reactors 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 estimate, as described below.

The total inventory of assemblies that will require handling during decommissioning is based upon several assumptions. The pickup of commercial fuel is assumed to begin in the year 2018. The maximum rate at which the fuel is removed from the commercial sites is based upon an annual capacity at the geologic repository of 3,000 metric tons of uranium (MTU). Any delay in the startup of the repository or decrease in the rate of acceptance will correspondingly prolong the transfer process and result in the fuel remaining at the site longer.

In all three scenarios, the ISFSI will continue to operate until such time that the transfer of spent fuel to the DOE can be completed. Assuming that the DOE commences repository operation in 2018, fuel is projected to be removed from the Braidwood site by the year 2065. In the Delayed DECON scenario, the ISFSI is only used to store fuel placed during plant operations. Spent fuel off-loaded from the reactors after operations cease, remains in the pool during the transfer period. The inventory of fuel assemblies located in the spent fuel pool is preferentially off-loaded as the allocations permit.

Operation and maintenance costs for the storage facilities (the ISFSI and the pool for the Delayed DECON scenario) are included within the estimates and address the cost for staffing the facilities, as well as security, insurance, and licensing fees. The estimates include the costs to purchase (DECON and SAFSTOR scenarios), load, and transfer the fuel storage canisters. Costs are also provided for the final disposition of the facilities once the transfer is complete.

Repository Startup

Operation of the DOE's yet-to-be constructed geologic repository is contingent upon the review and approval of the facility's license application by the NRC, the successful resolution of pending litigation, and the development of a national transportation system. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. The NRC formally docketed the DOE's license application on September 8, 2008, triggering a three-year deadline, with a possible one-year extension, set by Congress for the NRC to decide on whether to grant a construction authorization.

Construction, if adequately funded, could take five to six years after the DOE receives authorization to proceed. As such, the spent fuel management plan described in this section is predicated upon the DOE initiating the pickup of commercial fuel in the year 2018.

Spent Fuel Management Model

The Exelon nuclear fleet consists of 21 units at 11 sites in Illinois, Pennsylvania, and New Jersey, including the inactive units at Dresden, Peach Bottom, and Zion. The ability to complete the decommissioning of these units, particularly for the DECON and Delayed DECON alternatives, is highly dependent upon when the DOE is assumed to remove spent fuel from the sites.

The DOE's repository program assumes that spent fuel will be accepted for disposal from the nation's commercial nuclear plants in the order (the "queue") in which it was removed from service ("oldest fuel first").[21] A computer model developed by Exelon Nuclear was used to determine when the DOE would provide allocations in the queue for removal of spent fuel from the individual sites. Repository operations were based upon annual industry-wide receipt of 400 Metric Tons Heavy Metal

(MTHM) in the first year of operation, a total of 3,800 MTHM in years 2 through 4 and 3,000 MTHM for year 5 and beyond.[22]

ISFSIs are constructed as necessary to maintain full-core discharge capability at the individual sites. Once the DOE begins repository operations, queue allocations are used to ship spent fuel from Exelon's operating sites. Spent fuel shipments are then made from decommissioning sites in the order of retirement.

Canister Design

The design and capacity of the ISFSI is based upon a vertical cask system, with a 32-fuel assemblies capacity, is assumed for future cask acquisitions. A unit cost of $500,000 is used for pricing the internal multi-purpose canister (MPC), with an additional cost of $250,000 for the concrete storage module. The DOE is assumed to provide the MPC for fuel transferred directly from the pool to the DOE at no cost to the owner.

Canister Loading and Transfer

An average cost of $250,000 is used for the labor to load/transport the spent fuel from the pool to the ISFSI pad, based upon Exelon experience. For estimating purposes, 50% of this cost is used to estimate the cost to transfer the fuel from the ISFSI to the DOE.

Operations and Maintenance

Annual costs (excluding labor) of approximately $763,000 and $88,000 are used for operation and maintenance of each spent fuel pool and the ISFSI, respectively.

ISFSI Design Considerations

A multi-purpose (storage and transport) dry shielded storage canister with a vertical, reinforced concrete storage module is used as a basis for the cost analysis. The final core off load from each unit, equivalent to 14 modules, 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 estimate.

3.6.2 Reactor Vessel and Internal Components

The NSSS (reactor vessel and reactor coolant system components) will be decontaminated using chemical agents prior to the start of cutting operations (for DECON alternative only). A decontamination factor (average reduction) of 10 is assumed for the process.

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 will dictate segmentation and packaging methodology.

The dismantling of the reactor internals will generate radioactive waste considered unsuitable for shallow land disposal (i.e., GTCC). Although the material is not classified as high-level waste, the DOE has indicated it will accept this waste for disposal at the future high-level waste repository.[23] However, the DOE has not been forthcoming with an acceptance criteria or disposition schedule for this material, and numerous questions remain as to the ultimate disposal cost and waste form requirements. As such, for purposes of this study, the GTCC has been packaged and disposed of as high-level waste, at 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 Braidwood site.

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. 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 Braidwood 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 the reactor vessel will require segmentation, as a bounding condition.

3.6.3 Primary System Components

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 will be 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, will be removed to create sufficient laydown space for processing these large components.

The generators will be rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they will be lowered onto a dolly. Once each steam generator has been placed in the horizontal position, nozzles and other openings will be welded closed. The lower shell will have a carbon steel membrane welded to its outside surface for shielding, if required, during transport. The interior volume will be filled with low-density cellular concrete for

stabilization of the internal contamination and to satisfy burial ground packaging requirements. When this stage has been completed, each generator will be moved out of containment and lowered onto a multi-wheeled transporter to be staged at an on-site storage area and await transport to the disposal facility. The pressurizer will be removed using the same technique. Each component will then be loaded onto a railcar for transport to the disposal facility.

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

Braidwood Unit 1 has replaced its original set of steam generators; this original set is still on site, stored within a concrete protective structure. The cost for transportation and disposal of this original set of Unit 1 steam generators has been included in this analysis.

3.6.4 Main Turbine and Condenser

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

3.6.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.[24] 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 §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.

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

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter. Truck transport costs were estimated using published tariffs from Tri-State Motor Transit.[25]

3.6.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is treated to reduce the total volume requiring controlled disposal. The treated material, meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning and recovery of the waste stream is performed off site at a licensed processing center.

The mass of radioactive waste generated during the various decommissioning activities is reported by line-item in Appendices C, D and E, and summarized in Section 5. The Section 5 waste summaries are consistent with 10 CFR §61 classifications. Commercially available steel containers are 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 waste volumes are calculated on the exterior package dimensions for containerized material or a dimensional calculation for components serving as their own waste containers.

The more highly activated reactor components are transported in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, with surcharges added for the special handling requirements and the radiological characteristics 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 calculated using current disposal agreements, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon Exelon's current disposal agreement with EnergySolutions for its facility in Clive, Utah.

Since the EnergySolutions facility is not able to accept the higher activity waste (Class B and C) generated in the decontamination of the reactor vessel and segmentation of the components closest to the core, the cost of disposal of this material at a yet-to-be determined facility were based upon Exelon's last negotiated rates for the Barnwell facility.

Material exceeding Class C limits (limited to material closest to the reactor core and comprising a small percentage of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multipurpose canisters used for spent fuel storage/transport and designated for geologic disposal.

3.6.7 Site Conditions Following Decommissioning

The NRC will terminate (or amend) the site license when 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 the 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. The excavations will be regraded such that the power block area will have a final contour consistent with adjacent surroundings.

3.7 ASSUMPTIONS

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

3.7.1 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.

3.7.2 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 Exelon or from comparable industry information.

Exelon 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 Exelon.

3.7.3 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.[26] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Braidwood components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from CR-0130[27] and CR-0672,[28] and benchmarked to the long-lived values from 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 reactor building structures 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.

3.7.4 General

Transition Activities

Existing warehouses will be cleared of non-essential material and remain for use by Exelon and its subcontractors. The plant's operating staff will perform 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.
- Processes 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. Exelon 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 possible salvage 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 will be removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts will also be 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 for the cost of energy consumption 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."[29] NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Taxes

Property taxes are included for all decommissioning periods. Exelon provided a schedule of decreasing tax payments against the current tax assessment. These reductions continue until reaching a minimum property tax payment of $1 million per year for the site; this level is maintained for the balance of the decommissioning program.

Site Modifications

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

3.8 COST ESTIMATE SUMMARY

A schedule of expenditures for each scenario is provided in Tables 3.1 through 3.3. Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in thousands of 2009 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure. The annual expenditures are based upon the detailed activity costs reported in Appendices C through E, along with the schedules discussed in Section 4.

TABLE 3.1a
BRAIDWOOD NUCLEAR POWER STATION, UNIT 1
DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2046	11,255	1,947	316	9	2,908	16,434
2047	57,778	11,041	1,833	1,798	14,742	87,193
2048	64,764	23,085	1,912	21,927	14,337	126,025
2049	56,634	22,182	1,369	21,464	10,621	112,269
2050	40,935	12,172	1,138	2,497	3,350	60,093
2051	40,935	12,172	1,138	2,497	3,350	60,093
2052	12,925	3,603	330	730	1,987	19,576
2053	1,455	95	0	7	1,424	2,982
2054	22,422	1,445	243	25	2,024	26,157
2055	17,444	6,475	152	0	1,298	25,369
2056	17,492	6,493	152	0	1,301	25,438
2057	7,956	2,484	58	0	1,330	11,828
2058	2,053	0	0	0	1,350	3,403
2059	2,053	0	0	0	1,350	3,403
2060	2,059	0	0	0	1,354	3,412
2061	2,484	1,294	0	0	1,350	5,128
2062	2,484	1,294	0	0	1,350	5,128
2063	2,484	1,294	0	0	1,350	5,128
2064	2,490	1,294	0	0	1,354	5,137
2065	2,484	1,323	0	0	2,323	6,130
2066	1,729	1,093	0	112	14,026	16,960
Total	372,317	110,786	8,640	51,065	84,479	627,287

TABLE 3.1b
BRAIDWOOD NUCLEAR POWER STATION, UNIT 2
DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	1,826	324	58	2	526	2,736
2048	48,127	8,841	1,583	354	14,640	73,546
2049	63,206	20,857	2,174	16,083	21,934	124,253
2050	67,829	23,207	1,420	21,889	9,960	124,305
2051	62,104	13,596	1,138	3,622	3,885	84,345
2052	62,275	13,633	1,141	3,632	3,896	84,577
2053	51,973	9,069	850	3,316	3,657	68,865
2054	31,994	2,648	336	493	2,142	37,613
2055	22,912	9,089	152	0	1,299	33,450
2056	22,974	9,113	152	0	1,302	33,542
2057	10,054	3,486	58	0	1,330	14,928
2058	2,053	0	0	0	1,350	3,403
2059	2,053	0	0	0	1,350	3,403
2060	2,059	0	0	0	1,354	3,412
2061	2,448	1,186	0	0	1,350	4,984
2062	2,484	1,294	0	0	1,350	5,128
2063	2,484	1,294	0	0	1,350	5,128
2064	2,490	1,294	0	0	1,354	5,137
2065	2,484	1,323	0	0	2,323	6,130
2066	1,729	1,093	0	112	14,026	16,960
Total	465,559	121,347	9,062	49,502	90,377	735,847

TABLE 3.2a
BRAIDWOOD NUCLEAR POWER STATION, UNIT 1
DELAYED DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2046	8,655	232	316	9	538	9,749
2047	43,276	3,172	1,517	430	4,413	52,807
2048	8,309	1,613	657	461	4,872	15,912
2049	5,134	261	303	27	2,313	8,037
2050	5,134	261	303	27	2,313	8,037
2051	5,134	261	303	27	2,313	8,037
2052	5,148	261	304	27	2,319	8,059
2053	5,134	261	303	27	2,313	8,037
2054	5,134	261	303	27	2,313	8,037
2055	5,134	261	303	27	2,313	8,037
2056	5,148	261	304	27	2,319	8,059
2057	5,134	261	303	27	2,313	8,037
2058	5,134	261	303	27	2,313	8,037
2059	5,134	261	303	27	2,313	8,037
2060	5,148	261	304	27	2,319	8,059
2061	6,787	5,220	303	27	2,313	14,649
2062	6,849	5,436	303	27	2,310	14,924
2063	1,602	254	152	26	1,411	3,444
2064	1,643	362	152	26	1,415	3,598
2065	2,141	1,551	155	26	1,411	5,284
2066	40,924	1,532	1,517	36	1,322	45,331
2067	55,742	11,425	1,479	10,244	13,622	92,512
2068	50,596	15,147	1,390	17,126	15,962	100,221
2069	34,063	4,774	1,138	2,019	3,078	45,072
2070	34,063	4,774	1,138	2,019	3,078	45,072
2071	2,353	262	41	79	972	3,706
2072	16,773	726	191	22	1,430	19,142
2073	17,133	5,890	170	4	834	24,030
2074	15,897	6,564	152	0	706	23,319
2075	9,582	3,956	91	0	425	14,055
Total	418,033	76,017	14,505	32,900	87,884	629,338

TABLE 3.2b
BRAIDWOOD NUCLEAR POWER STATION, UNIT 2
DELAYED DECON ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	1,746	43	58	2	89	1,938
2048	46,478	1,587	1,521	128	2,699	52,413
2049	21,186	3,921	859	1,057	17,689	44,710
2050	6,047	276	303	27	2,344	8,998
2051	6,047	276	303	27	2,344	8,998
2052	6,064	277	304	27	2,351	9,022
2053	6,047	276	303	27	2,344	8,998
2054	6,047	276	303	27	2,344	8,998
2055	6,047	276	303	27	2,344	8,998
2056	6,064	277	304	27	2,351	9,022
2057	6,047	276	303	27	2,344	8,998
2058	6,047	276	303	27	2,344	8,998
2059	6,047	276	303	27	2,344	8,998
2060	6,064	277	304	27	2,351	9,022
2061	6,047	276	303	27	2,344	8,998
2062	6,047	276	303	27	2,344	8,998
2063	7,772	5,451	303	27	2,344	15,898
2064	7,363	5,128	291	27	2,270	15,079
2065	2,730	1,564	152	26	1,394	5,867
2066	4,360	444	350	27	1,221	6,403
2067	27,288	2,064	1,517	34	1,703	32,606
2068	48,409	12,760	1,472	10,300	11,986	84,927
2069	54,459	13,072	1,341	11,595	11,801	92,268
2070	51,576	5,635	1,138	2,894	2,983	64,227
2071	51,576	5,635	1,138	2,894	2,983	64,227
2072	37,744	2,932	615	1,098	2,046	44,434
2073	22,356	8,209	170	4	803	31,541
2074	21,365	9,177	152	0	707	31,401
2075	12,877	5,531	91	0	426	18,926
Total	497,947	86,744	15,114	30,462	93,640	723,907

TABLE 3.3a
BRAIDWOOD NUCLEAR POWER STATION, UNIT 1
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2046	9,193	1,849	316	9	2,908	14,275
2047	45,804	10,758	1,517	430	13,427	71,937
2048	10,320	8,841	657	461	5,688	25,967
2049	7,016	7,587	303	27	3,458	18,391
2050	7,016	7,587	303	27	3,458	18,391
2051	7,016	7,587	303	27	3,458	18,391
2052	4,146	2,386	196	26	2,009	8,764
2053	2,961	256	152	26	1,411	4,806
2054	2,961	256	152	26	1,411	4,806
2055	2,961	256	152	26	1,411	4,806
2056	2,969	257	152	26	1,415	4,819
2057	2,961	256	152	26	1,411	4,806
2058	2,961	256	152	26	1,411	4,806
2059	2,961	256	152	26	1,411	4,806
2060	2,969	257	152	26	1,415	4,819
2061	3,392	1,550	152	26	1,411	6,531
2062	3,392	1,550	152	26	1,411	6,531
2063	3,392	1,550	152	26	1,411	6,531
2064	3,400	1,551	152	26	1,415	6,544
2065	3,389	1,550	152	26	1,410	6,527
2066	1,968	254	152	26	1,219	3,618
2067	1,968	254	152	26	1,219	3,618
2068	1,973	254	152	26	1,222	3,628
2069	1,968	254	152	26	1,219	3,618
2070	1,968	254	152	26	1,219	3,618
2071	1,968	254	152	26	1,219	3,618
2072	1,973	254	152	26	1,222	3,628
2073	1,968	254	152	26	1,219	3,618
2074	1,968	254	152	26	1,219	3,618
2075	1,968	254	152	26	1,219	3,618

TABLE 3.3a (continued)
BRAIDWOOD NUCLEAR POWER STATION, UNIT 1
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2076	1,973	254	152	26	1,222	3,628
2077	1,968	254	152	26	1,219	3,618
2078	1,968	254	152	26	1,219	3,618
2079	1,968	254	152	26	1,219	3,618
2080	1,973	254	152	26	1,222	3,628
2081	1,968	254	152	26	1,219	3,618
2082	1,968	254	152	26	1,219	3,618
2083	1,968	254	152	26	1,219	3,618
2084	1,973	254	152	26	1,222	3,628
2085	1,968	254	152	26	1,219	3,618
2086	1,968	254	152	26	1,219	3,618
2087	1,968	254	152	26	1,219	3,618
2088	1,973	254	152	26	1,222	3,628
2089	1,968	254	152	26	1,219	3,618
2090	1,968	254	152	26	1,219	3,618
2091	1,968	254	152	26	1,219	3,618
2092	1,973	254	152	26	1,222	3,628
2093	1,968	254	152	26	1,219	3,618
2094	1,968	254	152	26	1,219	3,618
2095	1,968	254	152	26	1,219	3,618
2096	1,973	254	152	26	1,222	3,628
2097	1,968	254	152	26	1,219	3,618
2098	1,968	254	152	26	1,219	3,618
2099	11,569	570	492	28	1,237	13,896
2100	44,606	2,497	1,517	37	3,082	51,739
2101	55,753	14,481	1,460	14,300	16,253	102,247
2102	45,886	11,851	1,306	11,463	11,867	82,374
2103	34,061	4,736	1,138	1,888	3,085	44,908
2104	26,588	3,681	879	1,460	2,590	35,197
2105	1,182	95	0	7	894	2,178

TABLE 3.3a (continued)
BRAIDWOOD NUCLEAR POWER STATION, UNIT 1
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2106	22,951	2,206	260	24	1,493	26,933
2107	16,221	6,610	152	0	706	23,689
2108	16,266	6,629	152	0	708	23,754
2109	4,355	1,775	41	0	190	6,360
Total	475,587	119,905	17,975	31,413	135,111	779,992

TABLE 3.3b
BRAIDWOOD NUCLEAR POWER STATION, UNIT 2
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2047	1,835	307	58	2	526	2,728
2048	48,785	8,506	1,521	128	13,647	72,587
2049	24,390	11,064	859	1,057	18,404	55,773
2050	8,979	7,604	303	27	3,662	20,576
2051	8,979	7,604	303	27	3,662	20,576
2052	9,004	7,625	304	27	3,672	20,633
2053	5,789	3,626	221	27	2,432	12,094
2054	3,097	271	152	26	1,394	4,940
2055	3,097	271	152	26	1,394	4,940
2056	3,106	271	152	26	1,398	4,954
2057	3,097	271	152	26	1,394	4,940
2058	3,097	271	152	26	1,394	4,940
2059	3,097	271	152	26	1,394	4,940
2060	3,106	271	152	26	1,398	4,954
2061	3,493	1,457	152	26	1,394	6,521
2062	3,529	1,564	152	26	1,394	6,665
2063	3,529	1,564	152	26	1,394	6,665
2064	3,537	1,565	152	26	1,398	6,679
2065	3,526	1,564	152	26	1,394	6,662
2066	1,980	268	152	26	1,214	3,639
2067	1,980	268	152	26	1,214	3,639
2068	1,985	268	152	26	1,217	3,649
2069	1,980	268	152	26	1,214	3,639
2070	1,980	268	152	26	1,214	3,639
2071	1,980	268	152	26	1,214	3,639
2072	1,985	268	152	26	1,217	3,649
2073	1,980	268	152	26	1,214	3,639
2074	1,980	268	152	26	1,214	3,639
2075	1,980	268	152	26	1,214	3,639

TABLE 3.3b (continued)
BRAIDWOOD NUCLEAR POWER STATION, UNIT 2
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2076	1,985	268	152	26	1,217	3,649
2077	1,980	268	152	26	1,214	3,639
2078	1,980	268	152	26	1,214	3,639
2079	1,980	268	152	26	1,214	3,639
2080	1,985	268	152	26	1,217	3,649
2081	1,980	268	152	26	1,214	3,639
2082	1,980	268	152	26	1,214	3,639
2083	1,980	268	152	26	1,214	3,639
2084	1,985	268	152	26	1,217	3,649
2085	1,980	268	152	26	1,214	3,639
2086	1,980	268	152	26	1,214	3,639
2087	1,980	268	152	26	1,214	3,639
2088	1,985	268	152	26	1,217	3,649
2089	1,980	268	152	26	1,214	3,639
2090	1,980	268	152	26	1,214	3,639
2091	1,980	268	152	26	1,214	3,639
2092	1,985	268	152	26	1,217	3,649
2093	1,980	268	152	26	1,214	3,639
2094	1,980	268	152	26	1,214	3,639
2095	1,980	268	152	26	1,214	3,639
2096	1,985	268	152	26	1,217	3,649
2097	1,980	268	152	26	1,214	3,639
2098	1,980	268	152	26	1,214	3,639
2099	1,980	268	152	26	1,214	3,639
2100	13,596	860	810	30	1,233	16,529
2101	30,088	3,368	1,517	35	2,709	37,717
2102	55,589	16,442	1,443	14,006	15,804	103,283
2103	53,086	9,309	1,240	6,636	7,359	77,630
2104	51,714	5,573	1,141	2,739	2,944	64,110
2105	51,572	5,557	1,138	2,731	2,936	63,934

TABLE 3.3b (continued)
BRAIDWOOD NUCLEAR POWER STATION, UNIT 2
SAFSTOR ALTERNATIVE
SCHEDULE OF TOTAL ANNUAL EXPENDITURES
(thousands, 2009 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2106	28,645	3,128	304	128	1,377	33,583
2107	21,689	9,224	152	0	707	31,771
2108	21,748	9,249	152	0	709	31,858
2109	5,823	2,477	41	0	190	8,530
Total	547,975	130,242	18,489	28,800	140,021	865,527

4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this study follow the sequence 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 plans described in Section 3.4.1.

A schedule or sequence of activities is presented in Figure 4.1 for the DECON decommissioning alternative. The schedule is also representative of the work activities identified in the delayed dismantling scenarios, absent any spent fuel constraints. The scheduling sequence assumes that fuel is removed from the spent fuel pool within the first five and one-half years after operations cease at Unit 2. 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 2003" computer software.[30]

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 tables, 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 DECON decommissioning schedule:

- The fuel handling building is isolated until such time that all spent fuel has been discharged to the ISFSI. Decontamination and dismantling of the storage pool are initiated once the transfer of spent fuel to the ISFSI is complete.
- 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 schedule for decommissioning Braidwood. 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 also shown for the spent fuel cooling period, which determines the release of the fuel handling building for final decontamination.

Project timelines are provided in Figures 4.2 through 4.4; the milestone dates are based on this same shutdown date. The start of decommissioning activities in the Delayed Decommissioning scenario is concurrent with the end of the fuel transfer activity (i.e. to an off-site DOE facility).

FIGURE 4.1
DECON ACTIVITY SCHEDULE

ID	Task Name
1	Braidwood Unit 1 & 2 schedule
2	Shutdown Unit 1
3	Period 1a Unit 1 - Shutdown through transition
4	Certificate of permanent cessation of operations submitted
5	Fuel storage pool operations
6	Dry fuel storage operations
7	Reconfigure plant
8	Prepare activity specifications
9	Perform site characterization
10	PSDAR submitted
11	Written certificate of permanent removal of fuel submitted
12	Site specific decommissioning cost estimate submitted
13	DOC staff mobilized
14	Period 1b Unit 1 - Decommissioning preparations
15	Fuel storage pool operations
16	Reconfigure plant (continued)
17	Dry fuel storage operations
18	Prepare detailed work procedures
19	Decon NSSS
20	Isolate spent fuel pool
21	Period 2a Unit 1 - Large component removal
22	Fuel storage pool operations
23	Dry fuel storage operations
24	Preparation for reactor vessel removal
25	Reactor vessel & internals
26	Remaining large NSSS components disposition
27	Move vessel cutter to Unit 2
28	Non-essential systems
29	Main turbine/generator
30	Main condenser
31	License termination plan submitted
32	Period 2b Unit 1 - Decontamination (wet fuel)
33	Fuel storage pool operations
34	Dry fuel storage operations
35	Remove systems not supporting wet fuel storage
36	Decon buildings not supporting wet fuel storage
37	License termination plan approved
38	Fuel storage pool available for decommissioning
39	
40	Unit 2 Operations
41	Shutdown Unit 2
42	Period 1a Unit 2 - Shutdown through transition
43	Certificate of permanent cessation of operations submitted
44	Fuel storage pool operations
45	Dry fuel storage operations
46	Reconfigure plant
47	Prepare activity specifications
48	Perform site characterization
49	PSDAR submitted
50	Written certificate of permanent removal of fuel submitted
51	Site specific decommissioning cost estimate submitted
52	DOC staff mobilized
53	Period 1b Unit 2 - Decommissioning preparations
54	Fuel storage pool operations
55	Reconfigure plant (continued)
56	Dry fuel storage operations

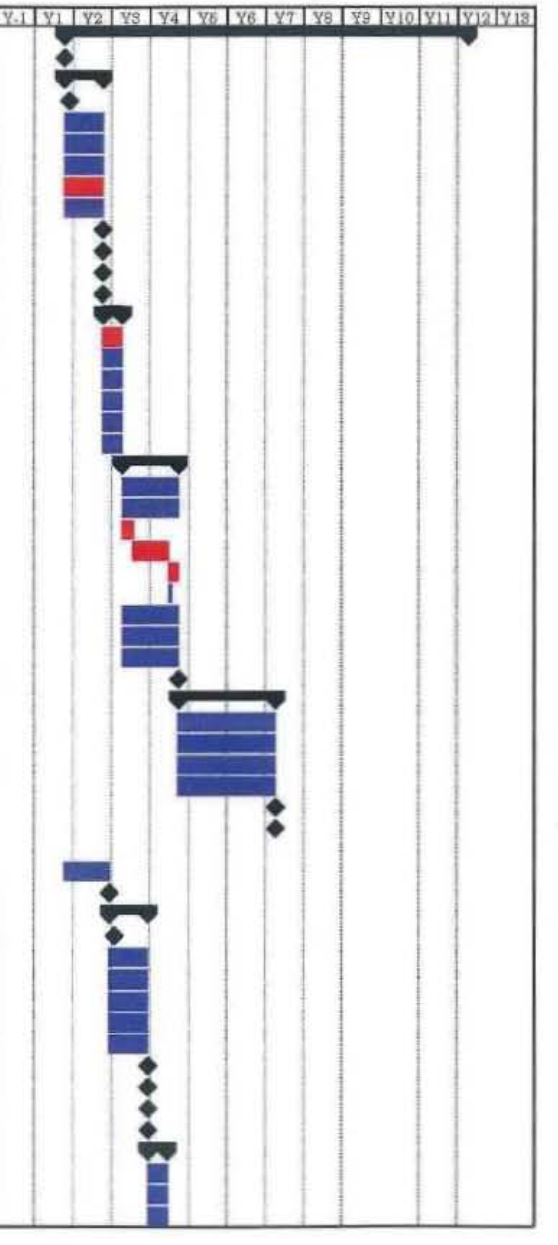


FIGURE 4.1
DECON ACTIVITY SCHEDULE
(continued)

ID	Task Name
57	Prepare detailed work procedures
58	Decon NSSS
59	Isolate spent fuel pool
60	Period 2a Unit 2 - Large component removal
61	Fuel storage pool operations
62	Dry fuel storage operations
63	Preparation for reactor vessel removal
64	Reactor vessel & internals
65	Remaining large NSSS components disposition
66	Non-essential systems
67	Main turbine/generator
68	Main condenser
69	License termination plan submitted
70	Period 2b Unit 2 - Decontamination (wet fuel)
71	Fuel storage pool operations
72	Dry fuel storage operations
73	Remove systems not supporting wet fuel storage
74	Decon buildings not supporting wet fuel storage
75	License termination plan approved
76	Fuel storage pool available for decommissioning
77	Period 2c Unit 2 - Decontamination following wet fuel storage
78	Dry fuel storage operations
79	Remove remaining systems
80	Decon wet fuel storage area
81	
82	Period 2e Unit 1 & 2 - Plant license termination
83	Dry fuel storage operations
84	Final Site Survey
85	NRC review & approval
86	Part 50 license terminated
87	Period 3b Unit 1 & 2 - Site restoration
88	Dry fuel storage operations
89	Building demolitions, backfill and landscaping
90	Building demolition
91	Landscape Site

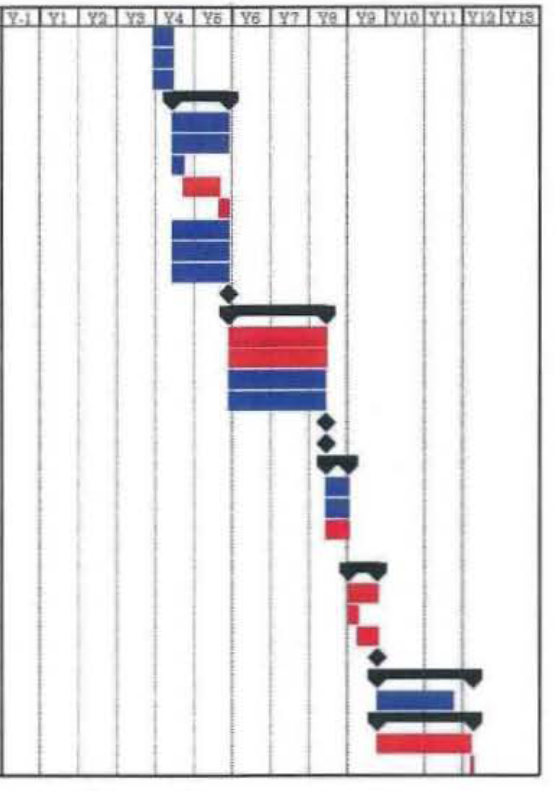


FIGURE 4.2
DECOMMISSIONING TIMELINE
DECON
(not to scale)

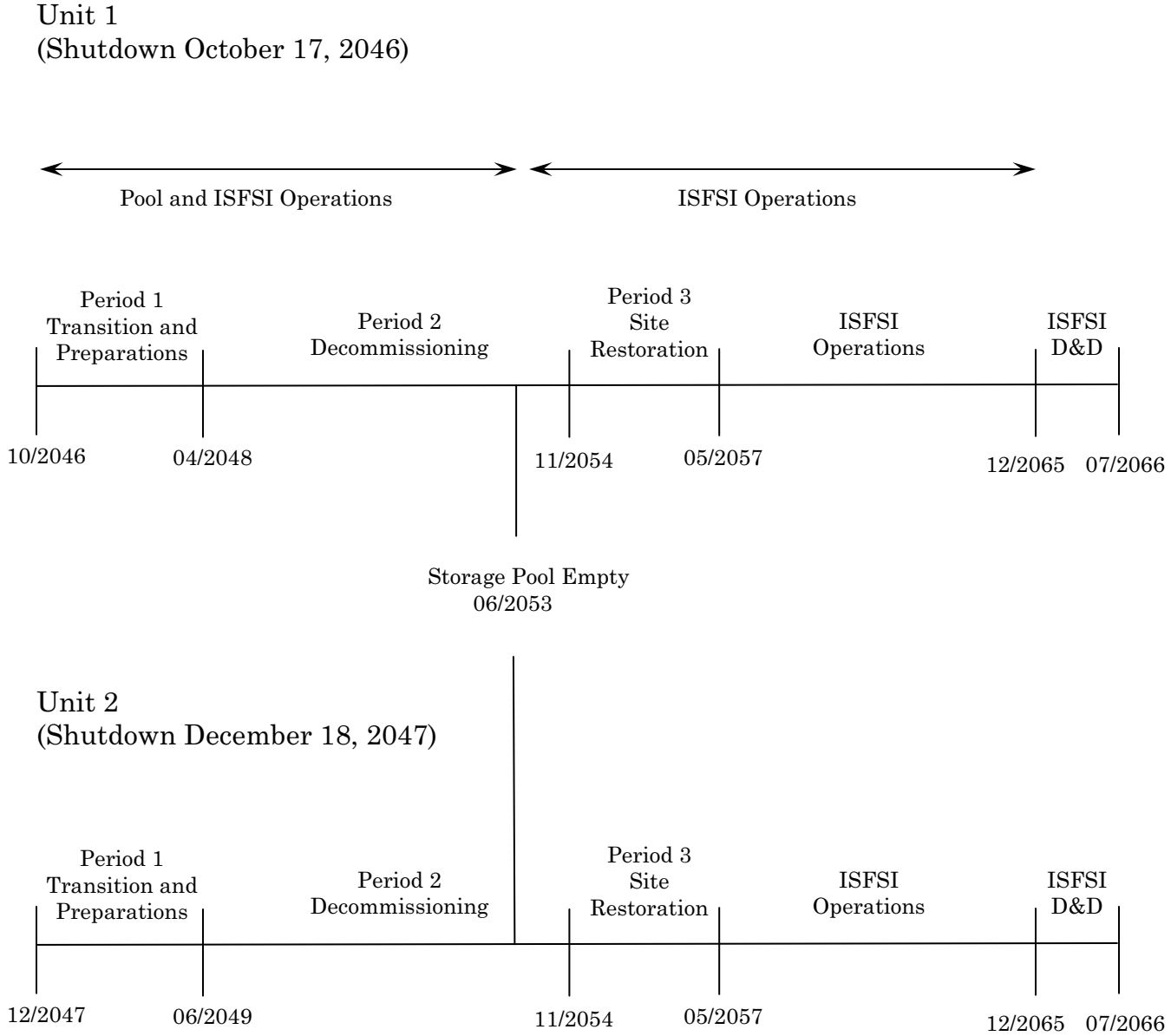


FIGURE 4.3
DECOMMISSIONING TIMELINE
DELAYED DECON
(not to scale)

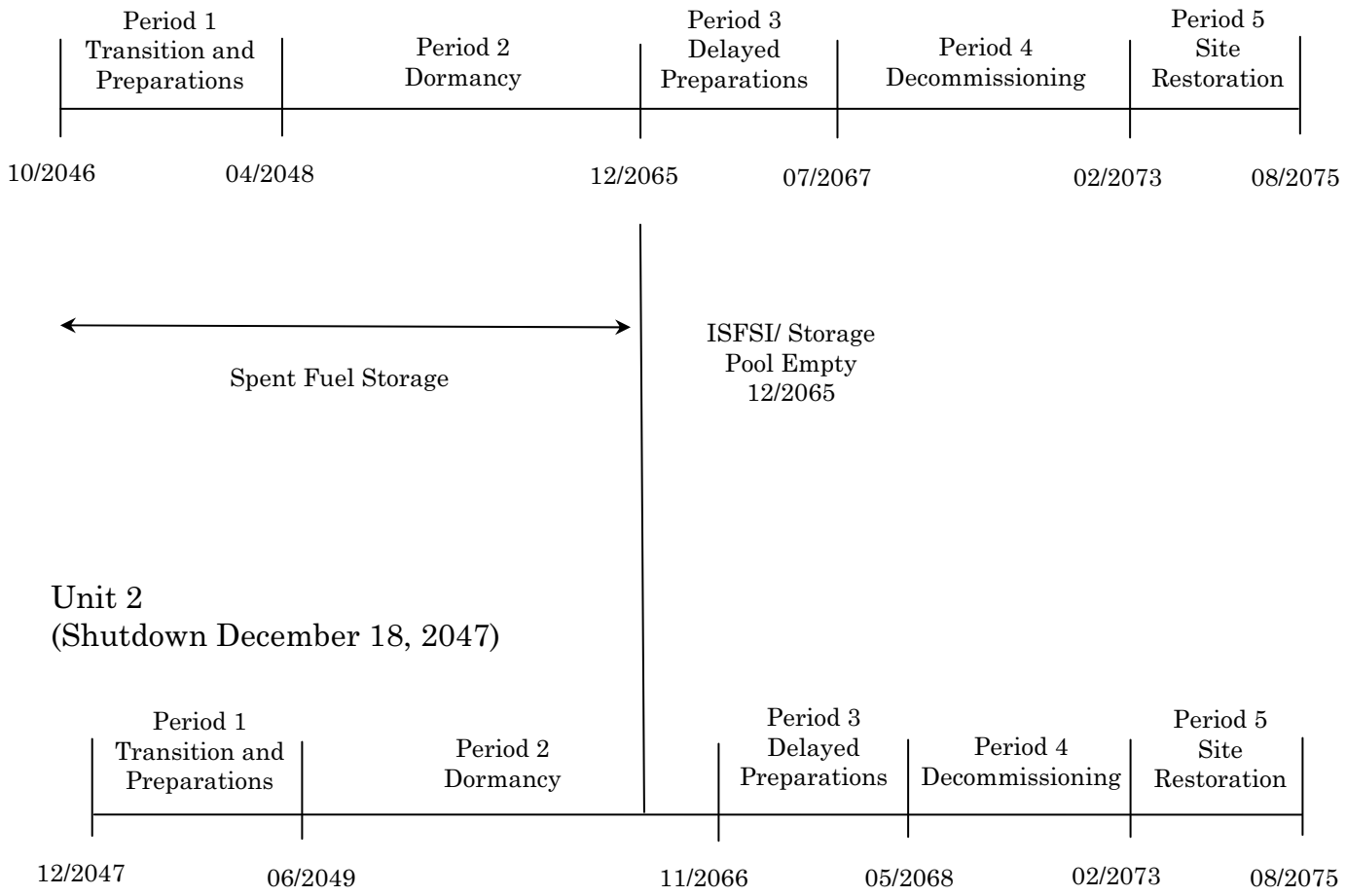
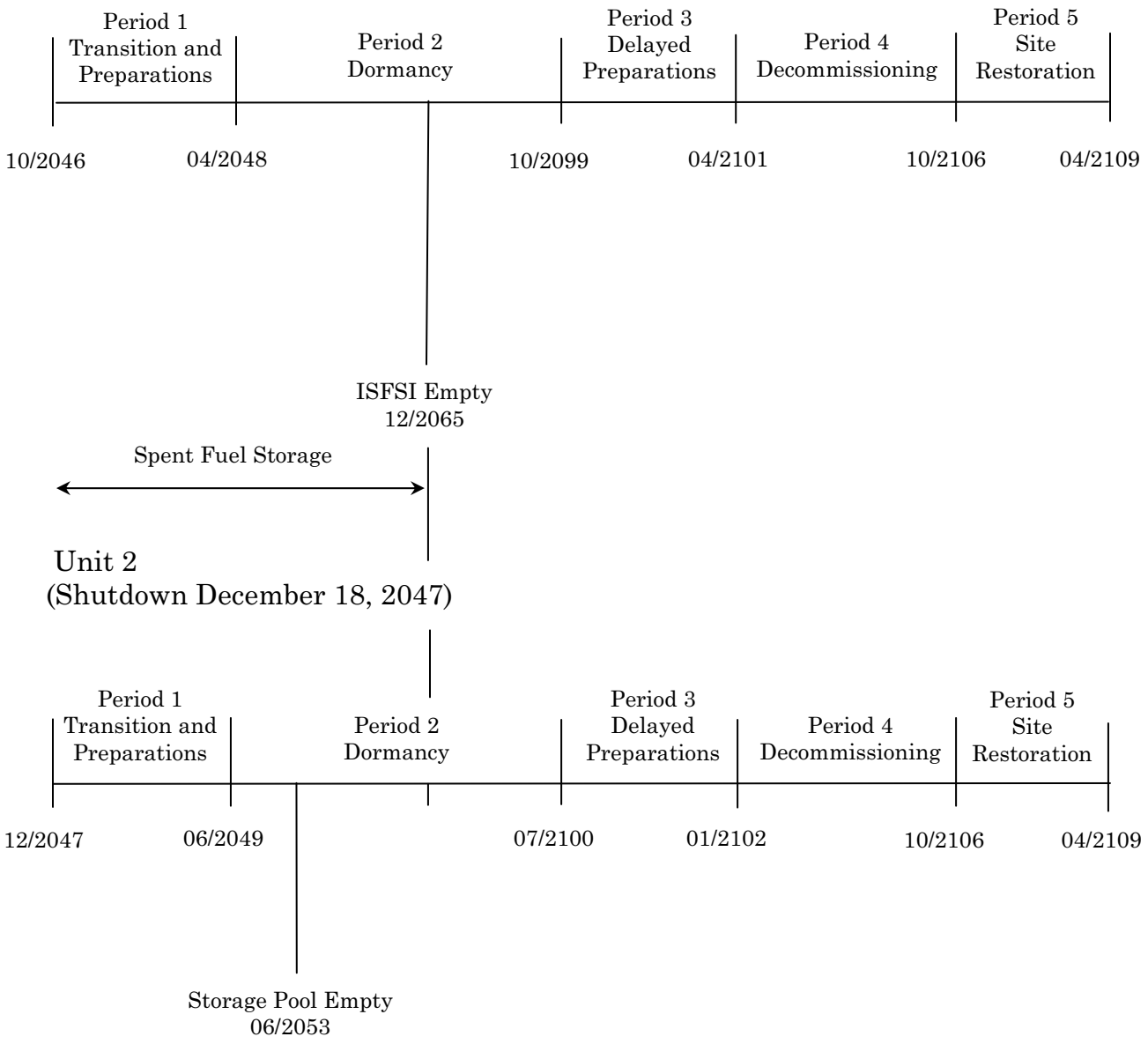


FIGURE 4.4
DECOMMISSIONING TIMELINE
SAFSTOR
(not to scale)



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(s). This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,[31] 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, §71 defines radioactive material as it pertains to packaging and transportation and §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 §173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in subpart 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 is shown on a line-item basis in Appendices C, D, and E and summarized in Tables 5.1 through 5.3. The quantified waste volume summaries shown in these tables are consistent with §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 generated in the decontamination and dismantling of Braidwood is primarily generated during Period 2 of the DECON alternative and Period 4 of the deferred alternatives. Material that is considered potentially contaminated when removed from the radiologically controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

Disposal fees are calculated using current disposal agreements, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon Exelon's current disposal agreement with EnergySolutions for its facility in Clive, Utah.

Since the EnergySolutions facility is not able to accept the higher activity waste (Class B and C) generated in the decontamination of the reactor vessel and segmentation of the components closest to the core, the cost of disposal of this material at a yet-to-be determined facility are based upon Exelon's previously negotiated cost of disposal at the Barnwell site.

TABLE 5.1
DECOMMISSIONING WASTE SUMMARY
DECON

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions	A	217,956	20,704,885
	Barnwell	B	8,007	997,337
	Barnwell	C	918	96,896
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,010	208,292
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	383,743	14,849,524
Total [2]			611,635	36,856,934
Scrap Metal				269,440,000

[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
DECOMMISSIONING WASTE SUMMARY
DELAYED DECON

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions	A	182,891	16,363,111
	Barnwell	B	6,260	803,190
	Barnwell	C	918	96,896
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,010	208,292
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	444,838	17,357,515
Total [2]			635,917	34,829,004
Scrap Metal				269,696,000

[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 5.3
DECOMMISSIONING WASTE SUMMARY
SAFSTOR

Waste	Cost Basis	Class [1]	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (near-surface disposal)	EnergySolutions	A	204,378	16,591,472
	Barnwell	B	5,258	692,576
	Barnwell	C	939	95,516
Greater than Class C (geologic repository)	Spent Fuel Equivalent	GTCC	1,010	208,292
Processed/Conditioned (off-site recycling center)	Recycling Vendors	A	446,895	17,585,892
Total [2]			658,481	35,173,748
Scrap Metal				269,696,000

[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 Braidwood relied upon the site-specific, technical information developed for a previous analysis prepared in 2004. While not an engineering study, the estimates provide Exelon with sufficient information to assess its financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The estimates described in this report are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the plant's spent fuel pool for a minimum of five and one-half years following the cessation of operations for continued cooling of the assemblies. For the DECON and SAFSTOR scenarios, the ISFSI is expanded to accommodate the spent fuel, once sufficiently cooled, until such time that the DOE can complete the transfer of the assemblies to its repository. The spent fuel remains in the storage pool in the Delayed-DECON alternative.

The cost projected to promptly decommission (DECON) Braidwood is estimated to be $1,363.1 million. The majority of this cost (approximately 71.2%) is associated with the physical decontamination and dismantling of the nuclear units so that the licenses can be terminated. Another 17.5% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 11.3% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 through 6.3, 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 Exelon will oversee the decommissioning program, using a DOC to manage the decommissioning labor force and the associated subcontractors. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating license is terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pool will remain operational for a minimum of five and one-half years following the cessation of operations. The pool

will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool areas. Over the five and one-half year period, the spent fuel will be packaged into transportable steel canisters for future loading into a DOE-provided transport cask (DECON and SAFSTOR alternatives). The canisters will be stored in concrete overpacks at the ISFSI until the DOE is able to receive them. Dry storage of the fuel under a separate license provides additional flexibility in the event the DOE is not able to meet the current timetable for completing the transfer of assemblies to an off-site facility and minimizes the associated caretaking expenses.

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, disposal of the majority of the radioactive material is at EnergySolutions facility in Clive, Utah or some alternative facility. Highly activated components, requiring additional isolation from the environment, are packaged for geologic disposal. Disposal of these components 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 table for processing is all-inclusive, incorporating the ultimate disposition of the material.

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

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the

general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear unit.

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

Cost Element	Total	Percentage
Decontamination	36,446	2.7
Removal	249,366	18.3
Packaging	29,993	2.2
Transportation	20,786	1.5
Waste Disposal	119,684	8.8
Off-site Waste Processing	8,110	0.6
Program Management [1]	591,251	43.4
Spent Fuel Pool Isolation	11,143	0.8
Spent Fuel Management [2]	164,291	12.1
Insurance and Regulatory Fees	23,532	1.7
Energy	17,702	1.3
Characterization and Licensing Surveys	33,288	2.4
Property Taxes	39,113	2.9
Miscellaneous Equipment	12,921	0.9
Site O&M	5,508	0.4
Total [3]	1,363,134	100.0

Cost Element	Total	Percentage
NRC License Termination	971,127	71.2
Spent Fuel Management	238,232	17.5
Site Restoration	153,775	11.3
Total [3]		100.0

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

TABLE 6.2
SUMMARY OF DECOMMISSIONING COST ELEMENTS
DELAYED DECON
(thousands of 2009 dollars)

Cost Element	Total	Percentage
Decontamination	31,501	2.3
Removal	244,860	18.1
Packaging	22,717	1.7
Transportation	17,812	1.3
Waste Disposal	81,123	6.0
Off-site Waste Processing	9,465	0.7
Program Management [1]	700,709	51.8
Spent Fuel Pool Isolation	11,143	0.8
Spent Fuel Management [2]	54,256	4.0
Insurance and Regulatory Fees	34,954	2.6
Energy	29,619	2.2
Characterization and Licensing Surveys	36,228	2.7
Property Taxes	49,101	3.6
Miscellaneous Equipment	21,642	1.6
Site O&M	8,115	0.6
Total [3]	1,353,245	100.0

Cost Element	Total	Percentage
NRC License Termination	935,745	69.1
Spent Fuel Management	260,353	19.2
Site Restoration	157,147	11.6
Total [3]		100.0

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

TABLE 6.3
SUMMARY OF DECOMMISSIONING COST ELEMENTS
SAFSTOR
(thousands of 2009 dollars)

Cost Element	Total	Percentage
Decontamination	31,130	1.9
Removal	252,829	15.4
Packaging	22,556	1.4
Transportation	17,205	1.0
Waste Disposal	77,849	4.7
Off-site Waste Processing	9,589	0.6
Program Management [1]	781,887	47.5
Spent Fuel Pool Isolation	11,143	0.7
Spent Fuel Management [2]	160,933	9.8
Insurance and Regulatory Fees	69,055	4.2
Energy	36,464	2.2
Characterization and Licensing Surveys	36,228	2.2
Property Taxes	86,125	5.2
Miscellaneous Equipment	34,732	2.1
Site O&M	17,793	1.1
Total [3]	1,645,519	100.0

Cost Element	Total	Percentage
NRC License Termination	1,253,252	76.2
Spent Fuel Management	235,093	14.3
Site Restoration	157,173	9.6
Total [3]		100.0

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

7. REFERENCES

1. "Decommissioning Cost Analysis for the Braidwood Nuclear Power Station," Document No. E16-1455-013, Rev. 0, TLG Services, Inc., January 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. Settlement: Exelon and the U.S. Department of Justice, in close consultation with the DOE, under which the government will reimburse Exelon for costs associated with storage of spent fuel at the company's nuclear stations pending DOE fulfilling its contractual obligation to accept commercial spent nuclear fuel. Additional amounts reimbursed annually for future costs. August 5, 2004

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

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

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

7. REFERENCES
(continued)

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

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-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. DOE/RW-0351, "Civilian Radioactive Waste Management System Waste Acceptance System Requirements Document", Revision 5, May 31, 2007

22. "Civilian Radioactive Waste Management System Requirements Document, DOE/RW-0406, Revision 8, September 2007

7. REFERENCES
(continued)

23. "Strategy for Management and Disposal of Greater-Than-Class C Low-Level Radioactive Waste," Federal Register Volume 60, Number 48 (p 13424 et seq.), March 1995

24. U.S. Department of Transportation, Title 49 of the Code of Federal Regulations, "Transportation," Parts 173 through 178, 2009

25. Tri-State Motor Transit Company, published tariffs, Interstate Commerce Commission (ICC), Docket No. MC-427719 Rules Tariff, March 2004, Radioactive Materials Tariff, January 2008

26. 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

27. 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

28. 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

29. "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

30. "Microsoft Project 2003," Microsoft Corporation, Redmond, WA, 2003

31. "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	56.57	1,903.64
Craftsmen	2.00	11.217	68.04	1,526.41
Foreman	1.00	11.217	70.74	793.49
General Foreman	0.25	11.217	72.83	204.23
Fire Watch	0.05	11.217	56.57	31.73
Health Physics Technician	1.00	11.217	51.42	576.78
Total labor cost				$5,036.28

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
• Blotting paper 50 @ $0.53/sq ft {1}	$26.50
• Plastic sheets/bags 50 @ $0.39/sq ft {2}	$19.50
• Gas torch consumables 1 @ $9.25 x 1 /hr {3}	$9.25
Subtotal cost of equipment and materials	$55.25
Overhead & profit on equipment and materials @ 16.25 %	$8.98
Total costs, equipment & material	$64.23

TOTAL COST:

Removal of contaminated heat exchanger <3000 pounds:	$5,100.51
Total labor cost:	$5,036.28
Total equipment/material costs:	$64.23
Total craft labor man-hours required per unit:	81.88

5. NOTES AND REFERENCES

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

- References for equipment & consumables costs:

    1. www.mcmaster.com online catalog - Spill Control (7193T88)
    2. R.S. Means (2009) 01 56 13.60-0200, page 20
    3. R.S. Means (2009) 01 54 33.40-6360, page 658

- Material and consumable costs were adjusted using the regional indices for Joliet, Illinois.

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	0.60
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	6.49
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	9.15
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	17.60
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	34.29
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	44.45
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	65.44
Removal of clean pipe >36 inches diameter, $/linear foot	77.81
Removal of clean valve >2 to 4 inches	116.71
Removal of clean valve >4 to 8 inches	175.97
Removal of clean valve >8 to 14 inches	342.95
Removal of clean valve >14 to 20 inches	444.51
Removal of clean valve >20 to 36 inches	654.36
Removal of clean valve >36 inches	778.06
Removal of clean pipe hanger for small bore piping	38.03
Removal of clean pipe hanger for large bore piping	141.22
Removal of clean pump, <300 pound	293.97
Removal of clean pump, 300-1000 pound	812.82
Removal of clean pump, 1000-10,000 pound	3,239.37
Removal of clean pump, >10,000 pound	6,255.04
Removal of clean pump motor, 300-1000 pound	342.74
Removal of clean pump motor, 1000-10,000 pound	1,350.30
Removal of clean pump motor, >10,000 pound	3,038.18
Removal of clean heat exchanger <3000 pound	1,733.40
Removal of clean heat exchanger >3000 pound	4,349.84
Removal of clean feedwater heater/deaerator	12,304.95
Removal of clean moisture separator/reheater	25,353.69
Removal of clean tank, <300 gallons	378.49
Removal of clean tank, 300-3000 gallon	1,198.86
Removal of clean tank, >3000 gallons, $/square foot surface area	9.93

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of clean electrical equipment, <300 pound	161.79
Removal of clean electrical equipment, 300-1000 pound	558.02
Removal of clean electrical equipment, 1000-10,000 pound	1,116.03
Removal of clean electrical equipment, >10,000 pound	2,637.70
Removal of clean electrical transformer < 30 tons	1,831.86
Removal of clean electrical transformer > 30 tons	5,275.41
Removal of clean standby diesel generator, <100 kW	1,871.07
Removal of clean standby diesel generator, 100 kW to 1 MW	4,176.37
Removal of clean standby diesel generator, >1 MW	8,645.93
Removal of clean electrical cable tray, $/linear foot	15.03
Removal of clean electrical conduit, $/linear foot	6.56
Removal of clean mechanical equipment, <300 pound	161.79
Removal of clean mechanical equipment, 300-1000 pound	558.02
Removal of clean mechanical equipment, 1000-10,000 pound	1,116.03
Removal of clean mechanical equipment, >10,000 pound	2,637.70
Removal of clean HVAC equipment, <300 pound	195.64
Removal of clean HVAC equipment, 300-1000 pound	670.50
Removal of clean HVAC equipment, 1000-10,000 pound	1,336.30
Removal of clean HVAC equipment, >10,000 pound	2,637.70
Removal of clean HVAC ductwork, $/pound	0.64
Removal of contaminated instrument and sampling tubing, $/linear foot	1.79
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	25.05
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	43.25
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	67.65
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	134.17
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	161.27
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	223.60
Removal of contaminated pipe >36 inches diameter, $/linear foot	264.52
Removal of contaminated valve >2 to 4 inches	514.31
Removal of contaminated valve >4 to 8 inches	620.02

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of contaminated valve >8 to 14 inches	1,288.21
Removal of contaminated valve >14 to 20 inches	1,637.58
Removal of contaminated valve >20 to 36 inches	2,182.56
Removal of contaminated valve >36 inches	2,591.72
Removal of contaminated pipe hanger for small bore piping	167.42
Removal of contaminated pipe hanger for large bore piping	567.05
Removal of contaminated pump, <300 pound	1,102.83
Removal of contaminated pump, 300-1000 pound	2,555.62
Removal of contaminated pump, 1000-10,000 pound	8,473.28
Removal of contaminated pump, >10,000 pound	20,635.56
Removal of contaminated pump motor, 300-1000 pound	1,084.65
Removal of contaminated pump motor, 1000-10,000 pound	3,445.94
Removal of contaminated pump motor, >10,000 pound	7,736.54
Removal of contaminated heat exchanger <3000 pound	5,100.51
Removal of contaminated heat exchanger >3000 pound	14,761.50
Removal of contaminated tank, <300 gallons	1,833.73
Removal of contaminated tank, >300 gallons, $/square foot	35.89
Removal of contaminated electrical equipment, <300 pound	861.12
Removal of contaminated electrical equipment, 300-1000 pound	2,092.89
Removal of contaminated electrical equipment, 1000-10,000 pound	4,030.84
Removal of contaminated electrical equipment, >10,000 pound	7,888.71
Removal of contaminated electrical cable tray, $/linear foot	41.50
Removal of contaminated electrical conduit, $/linear foot	20.07
Removal of contaminated mechanical equipment, <300 pound	958.09
Removal of contaminated mechanical equipment, 300-1000 pound	2,311.70
Removal of contaminated mechanical equipment, 1000-10,000 pound	4,444.97
Removal of contaminated mechanical equipment, >10,000 pound	7,888.71
Removal of contaminated HVAC equipment, <300 pound	958.09
Removal of contaminated HVAC equipment, 300-1000 pound	2,311.70
Removal of contaminated HVAC equipment, 1000-10,000 pound	4,444.97

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of contaminated HVAC equipment, >10,000 pound	7,888.71
Removal of contaminated HVAC ductwork, $/pound	2.43
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	4.63
Additional decontamination of surface by washing, $/square foot	9.64
Additional decontamination of surfaces by hydrolasing, $/square foot	40.20
Decontamination rig hook up and flush, $/ 250 foot length	8,085.83
Chemical flush of components/systems, $/gallon	15.40
Removal of clean standard reinforced concrete, $/cubic yard	153.19
Removal of grade slab concrete, $/cubic yard	210.32
Removal of clean concrete floors, $/cubic yard	394.86
Removal of sections of clean concrete floors, $/cubic yard	1,200.05
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	255.64
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	2,389.41
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	323.12
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	3,160.92
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	507.10
Removal of below-grade suspended floors, $/cubic yard	394.86
Removal of clean monolithic concrete structures, $/cubic yard	1,017.13
Removal of contaminated monolithic concrete structures, $/cubic yard	2,380.99
Removal of clean foundation concrete, $/cubic yard	796.36
Removal of contaminated foundation concrete, $/cubic yard	2,217.60
Explosive demolition of bulk concrete, $/cubic yard	33.98
Removal of clean hollow masonry block wall, $/cubic yard	113.13
Removal of contaminated hollow masonry block wall, $/cubic yard	364.98
Removal of clean solid masonry block wall, $/cubic yard	113.13
Removal of contaminated solid masonry block wall, $/cubic yard	364.98
Backfill of below-grade voids, $/cubic yard	22.74
Removal of subterranean tunnels/voids, $/linear foot	129.34
Placement of concrete for below-grade voids, $/cubic yard	133.82
Excavation of clean material, $/cubic yard	3.06

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Excavation of contaminated material, $/cubic yard	43.32
Removal of clean concrete rubble (tipping fee included), $/cubic yard	23.70
Removal of contaminated concrete rubble, $/cubic yard	27.61
Removal of building by volume, $/cubic foot	0.33
Removal of clean building metal siding, $/square foot	1.40
Removal of contaminated building metal siding, $/square foot	4.66
Removal of standard asphalt roofing, $/square foot	2.83
Removal of transite panels, $/square foot	2.47
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	13.99
Scabbling contaminated concrete floors, $/square foot	8.87
Scabbling contaminated concrete walls, $/square foot	23.71
Scabbling contaminated ceilings, $/square foot	81.62
Scabbling structural steel, $/square foot	7.19
Removal of clean overhead crane/monorail < 10 ton capacity	770.65
Removal of contaminated overhead crane/monorail < 10 ton capacity	2,106.37
Removal of clean overhead crane/monorail >10-50 ton capacity	1,849.57
Removal of contaminated overhead crane/monorail >10-50 ton capacity	5,054.42
Removal of polar crane > 50 ton capacity	7,687.60
Removal of gantry crane > 50 ton capacity	32,971.33
Removal of structural steel, $/pound	0.24
Removal of clean steel floor grating, $/square foot	5.28
Removal of contaminated steel floor grating, $/square foot	15.02
Removal of clean free standing steel liner, $/square foot	14.89
Removal of contaminated free standing steel liner, $/square foot	42.06
Removal of clean concrete-anchored steel liner, $/square foot	7.44
Removal of contaminated concrete-anchored steel liner, $/square foot	48.98
Placement of scaffolding in clean areas, $/square foot	17.93
Placement of scaffolding in contaminated areas, $/square foot	29.87
Landscaping with topsoil, $/acre	19,589.25
Cost of CPC B-88 LSA box & preparation for use	2,085.23

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	1,727.86
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,561.80
Cost of CPC B-144 LSA box & preparation for use	8,998.74
Cost of LSA drum & preparation for use	192.04
Cost of cask liner for CNSI 14 195 cask	276.93
Cost of cask liner for CNSI 8 120A cask (resins)	7,721.08
Cost of cask liner for CNSI 8 120A cask (filters)	8,203.11
Decontamination of surfaces with vacuuming, $/square foot	0.89

APPENDIX C

DETAILED COST ANALYSIS

DECON

Page

Braidwood Nuclear Power Station, Unit 1 ..... C-2

Braidwood Nuclear Power Station, Unit 2 ..... C-12

Table C-1
Braidwood Nuclear Power Station, 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 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	885	133	1,018	1,018	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	590	89	679	679	-	-	-	-	-	-	-	-	-	5,000
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	483	73	556	556	-	-	-	-	-	-	-	-	-	4,096
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	581	87	668	601	-	67	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	492	74	565	509	-	57	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	838	126	964	964	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	767	115	882	882	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	189	28	217	109	-	109	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	368	55	423	212	-	212	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	106	16	122	61	-	61	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,464	670	5,134	4,520	-	613	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	283	42	326	326	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	145	22	167	167	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	13,704	2,056	15,759	15,146	-	613	-	-	-	-	-	-	-	73,753
Period 1a Additional Costs																					
1a.2.1	ISFSI Expansion	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,000	1,350	10,350	-	10,350	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	9,000	1,350	10,350	-	10,350	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	751	75	826	826	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	421	-	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-

Table C-1
Braidwood Nuclear Power Station, 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 1a Period-Dependent Costs (continued)																					
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	706	71	776	776	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	315	32	347	-	347	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	381	57	438	-	438	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	12,264
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	31,082	4,662	35,745	35,745	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	842	2	1	-	34	35,189	5,367	41,434	40,599	836	-	-	610	-	-	-	12,190	3	435,664
1a.0	TOTAL PERIOD 1a COST	-	842	2	1	-	34	67,792	10,257	78,928	55,744	22,571	613	-	610	-	-	-	12,190	3	509,417
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	559	84	642	578	-	64	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	295	44	339	339	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	159	24	183	46	-	137	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	428	64	493	493	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	142	21	163	81	-	81	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	142	21	163	163	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	118	18	136	68	-	68	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	184	28	212	-	-	212	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	184	28	212	-	-	212	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	322	48	370	333	-	37	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	322	48	370	333	-	37	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,923	588	4,511	3,663	-	848	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	623	-	-	-	-	-	-	311	934	934	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	623	-	-	-	-	-	3,923	900	5,445	4,597	-	848	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	6,341	1,902	8,243	8,243	-	-	-	-	-	-	-	-	30,500	10,852
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	6,341	1,902	8,243	8,243	-	-	-	-	-	-	-	-	30,500	10,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process liquid waste	57	-	81	377	-	3,379	-	938	4,832	4,832	-	-	-	375	889	-	-	121,195	246	-
1b.3.4	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.5	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
1b.3.6	Decon rig	1,400	-	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
1b.3.7	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,000	600	4,600	-	4,600	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,268	1,102	81	377	-	3,379	5,130	2,204	14,541	9,941	4,600	-	-	375	889	-	-	121,195	246	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	25	-	-	-	-	-	-	6	31	31	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	3,240	324	3,564	3,564	-	-	-	-	-	-	-	-	-	-

Table C-1
Braidwood Nuclear Power Station, 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 1b Period-Dependent Costs (continued)																					
1b.4.4	Health physics supplies	-	237	-	-	-	-	-	59	297	297	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	211	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	1	0	-	20	-	5	27	27	-	-	-	358	-	-	-	7,159	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,323	198	1,521	1,521	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	354	35	389	389	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	158	16	174	-	174	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	191	29	220	-	220	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	234	35	269	269	-	-	-	-	-	-	-	-	-	6,149
1b.4.14	DOC Staff Cost	-	-	-	-	-	-	5,217	783	5,999	5,999	-	-	-	-	-	-	-	-	-	63,789
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	15,652	2,348	17,999	17,999	-	-	-	-	-	-	-	-	-	213,326
1b.4	Subtotal Period 1b Period-Dependent Costs	25	448	1	0	-	20	26,829	3,920	31,243	30,824	419	-	-	358	-	-	-	7,159	2	283,263
1b.0	TOTAL PERIOD 1b COST	2,915	1,550	82	377	-	3,399	42,222	8,926	59,472	53,605	5,019	848	-	733	889	-	-	128,354	31,815	327,358
PERIOD 1 TOTALS		2,915	2,392	84	378	-	3,433	110,015	19,184	138,401	109,350	27,590	1,462	-	1,342	889	-	-	140,544	31,818	836,775
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	212	177	33	39	-	341	-	245	1,048	1,048	-	-	-	1,728	-	-	-	208,992	6,092	-
2a.1.1.2	Pressurizer Relief Tank	36	32	6	8	-	60	-	43	184	184	-	-	-	329	-	-	-	36,553	1,072	-
2a.1.1.3	Reactor Coolant Pumps & Motors	115	118	96	180	-	1,272	-	442	2,224	2,224	-	-	-	4,796	-	-	-	780,540	4,291	100
2a.1.1.4	Pressurizer	54	68	399	96	-	412	-	201	1,230	1,230	-	-	-	3,033	-	-	-	252,826	2,482	938
2a.1.1.5	Steam Generators	433	4,168	3,062	2,577	667	4,349	-	3,138	18,394	18,394	-	-	45,513	17,817	-	-	-	4,035,428	23,233	2,125
2a.1.1.6	Retired Steam Generator Units	-	-	1,535	2,673	580	3,416	-	1,495	9,700	9,700	-	-	39,289	14,064	-	-	-	3,041,432	10,800	1,500
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	101	80	176	42	-	59	-	109	568	568	-	-	-	2,843	-	-	-	50,181	2,843	-
2a.1.1.8	Reactor Vessel Internals	140	2,193	4,483	893	-	8,058	233	7,122	23,121	23,121	-	-	-	1,377	903	459	-	326,029	26,933	1,209
2a.1.1.9	Reactor Vessel	106	4,162	1,501	691	-	7,844	233	7,679	22,216	22,216	-	-	-	6,606	2,254	-	-	978,589	26,933	1,209
2a.1.1	Totals	1,197	10,998	11,292	7,197	1,247	25,811	466	20,475	78,684	78,684	-	-	84,802	52,594	3,156	459	-	9,710,570	104,680	7,082
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	650	388	38	203	284	-	309	1,872	1,872	-	-	5,088	2,833	-	-	-	686,663	10,223	-
2a.1.3	Main Condensers	-	1,312	170	59	143	211	-	428	2,324	2,324	-	-	6,756	1,992	-	-	-	482,702	20,428	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	1,171	-	-	-	-	-	176	1,346	1,346	-	-	-	-	-	-	-	-	12,130	-
2a.1.4.2	Auxiliary Building	-	644	-	-	-	-	-	97	741	741	-	-	-	-	-	-	-	-	6,782	-
2a.1.4.3	Refueling Water Storage Tank	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,299	-
2a.1.4.4	Steam Generator Storage Facility	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	507	-
2a.1.4	Totals	-	1,977	-	-	-	-	-	297	2,273	2,273	-	-	-	-	-	-	-	-	20,718	-
Disposal of Plant Systems																					
2a.1.5.1	Auxiliary Feedwater	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,244	-
2a.1.5.2	Auxiliary Steam	-	70	-	-	-	-	-	10	80	-	-	80	-	-	-	-	-	-	1,126	-
2a.1.5.3	Auxiliary Steam RCA	-	134	6	5	9	21	-	41	215	215	-	-	448	197	-	-	-	35,862	1,946	-
2a.1.5.4	Boric Acid Processing	501	546	52	39	57	182	-	452	1,830	1,830	-	-	2,981	2,231	-	-	-	275,609	15,951	-
2a.1.5.5	CO2 & H2	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	419	-
2a.1.5.6	CO2 & H2 RCA	-	38	1	1	1	5	-	11	59	59	-	-	67	50	-	-	-	7,168	575	-
2a.1.5.7	Chemical Feed	-	57	-	-	-	-	-	9	66	-	-	66	-	-	-	-	-	-	934	-
2a.1.5.8	Chilled Water	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,142	-
2a.1.5.9	Circulating Water	-	318	-	-	-	-	-	48	365	-	-	365	-	-	-	-	-	-	5,174	-
2a.1.5.10	Condensate	-	377	-	-	-	-	-	56	433	-	-	433	-	-	-	-	-	-	6,023	-
2a.1.5.11	Condensate Booster	-	339	-	-	-	-	-	51	390	-	-	390	-	-	-	-	-	-	5,428	-
2a.1.5.12	Condensate Cleanup	-	66	-	-	-	-	-	10	76	-	-	76	-	-	-	-	-	-	1,060	-

Table C-1
Braidwood Nuclear Power Station, 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
Disposal of Plant Systems (continued)																					
2a.1.5.13	Containment Spray	-	256	17	18	49	57	-	90	487	487	-	-	2,566	543	-	-	-	152,670	3,755	-
2a.1.5.14	Diesel Fuel Oil	-	102	-	-	-	-	-	15	117	-	-	117	-	-	-	-	-	-	1,615	-
2a.1.5.15	Essential Service Water	-	236	-	-	-	-	-	35	271	-	-	271	-	-	-	-	-	-	3,837	-
2a.1.5.16	Extraction Steam	-	189	-	-	-	-	-	28	217	-	-	217	-	-	-	-	-	-	3,089	-
2a.1.5.17	Feedwater	-	316	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	5,142	-
2a.1.5.18	Feedwater Drains	-	758	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	12,366	-
2a.1.5.19	Gland Steam	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	932	-
2a.1.5.20	Gland Water	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	828	-
2a.1.5.21	Main Steam	-	322	-	-	-	-	-	48	371	-	-	371	-	-	-	-	-	-	5,216	-
2a.1.5.22	Main Steam RCA	-	51	4	4	9	16	-	19	102	102	-	-	468	148	-	-	-	32,263	745	-
2a.1.5.23	Nitrogen	-	3	0	0	1	0	-	1	5	5	-	-	49	2	-	-	-	2,118	49	-
2a.1.5.24	Non-Essential Service Water	-	178	-	-	-	-	-	27	204	-	-	204	-	-	-	-	-	-	2,916	-
2a.1.5.25	Non-Essential Service Water RCA	-	93	8	8	17	30	-	36	192	192	-	-	897	287	-	-	-	62,152	1,308	-
2a.1.5.26	Off Gas	-	622	28	29	71	101	-	198	1,048	1,048	-	-	3,698	953	-	-	-	235,620	9,534	-
2a.1.5.27	Process Radiation Monitoring	-	45	1	1	1	2	-	12	62	62	-	-	75	19	-	-	-	4,792	748	-
2a.1.5.28	Process Sampling	-	133	2	3	9	8	-	37	193	193	-	-	466	76	-	-	-	25,755	2,166	-
2a.1.5.29	Screen Wash	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	821	-
2a.1.5.30	Station Air	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	498	-
2a.1.5.31	Station Heating	-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	1,771	-
2a.1.5.32	Switchgear Heat Removal	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	139	-
2a.1.5.33	Turbine Bldg Equip Drains	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	17	-
2a.1.5.34	Turbine Generator	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	901	-
2a.1.5.35	Turbine Oil	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	1,399	-
2a.1.5.36	Waste Oil Sumps	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	483	-
2a.1.5	Totals	501	5,903	119	108	224	423	-	1,495	8,773	4,193	-	4,580	11,715	4,504	-	-	-	834,009	101,293	-
2a.1.6	Scaffolding in support of decommissioning	-	1,103	6	1	6	2	-	278	1,397	1,397	-	-	306	19	-	-	-	15,459	18,871	-
2a.1	Subtotal Period 2a Activity Costs	1,698	21,944	11,975	7,403	1,823	26,731	466	23,282	95,323	90,743	-	4,580	108,666	61,942	3,156	459	-	11,729,400	276,213	7,082
Period 2a Collateral Costs																					
2a.3.1	Process liquid waste	206	-	98	440	-	449	-	291	1,484	1,484	-	-	-	1,518	-	-	-	96,825	296	-
2a.3.2	Small tool allowance	-	271	-	-	-	-	-	41	312	281	-	31	-	-	-	-	-	-	-	-
2a.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	13,000	1,950	14,950	-	14,950	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	206	271	98	440	-	449	13,000	2,282	16,746	1,765	14,950	31	-	1,518	-	-	-	96,825	296	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	73	-	-	-	-	-	-	18	91	91	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	494	49	544	544	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	6,445	644	7,089	6,380	-	709	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,714	-	-	-	-	-	428	2,142	2,142	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,610	-	-	-	-	-	392	3,002	3,002	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	11	4	-	210	-	54	280	280	-	-	-	3,770	-	-	-	75,402	17	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,844	277	2,120	2,120	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	968	97	1,065	1,065	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	147	15	162	-	162	-	-	-	-	-	-	-	-	-
2a.4.10	Site O&M Costs	-	-	-	-	-	-	184	28	211	211	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	561	84	645	-	645	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	65	10	74	-	74	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	642	96	738	738	-	-	-	-	-	-	-	-	-	16,877
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	18,869	2,830	21,699	21,699	-	-	-	-	-	-	-	-	-	233,211
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	32,405	4,861	37,265	37,265	-	-	-	-	-	-	-	-	-	434,203
2a.4	Subtotal Period 2a Period-Dependent Costs	73	4,324	11	4	-	210	62,622	9,883	77,128	75,538	881	709	-	3,770	-	-	-	75,402	17	684,291
2a.0	TOTAL PERIOD 2a COST	1,977	26,539	12,084	7,848	1,823	27,391	76,088	35,447	189,197	168,045	15,831	5,320	108,666	67,230	3,156	459	-	11,901,630	276,526	691,373

Table C-1
Braidwood Nuclear Power Station, 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 2b - Site Decontamination																					
Disposal of Plant Systems																					
2b.1.2.1	Chemical & Volume Control	895	1,208	73	52	17	302	-	843	3,389	3,389	-	-	868	2,895	-	-	-	291,539	31,015	-
2b.1.2.2	Chilled Water RCA	-	311	21	23	64	72	-	111	603	603	-	-	3,376	680	-	-	-	198,114	4,761	-
2b.1.2.3	Component Cooling RCA	-	661	43	44	110	152	-	231	1,241	1,241	-	-	5,759	1,439	-	-	-	362,801	9,740	-
2b.1.2.4	Electrical	-	3,047	-	-	-	-	-	457	3,504	-	-	3,504	-	-	-	-	-	-	48,490	-
2b.1.2.5	Electrical - Contaminated	-	1,249	14	24	122	18	-	340	1,767	1,767	-	-	6,385	170	-	-	-	274,560	19,147	-
2b.1.2.6	Electrical - RCA	-	1,881	39	64	318	47	-	543	2,892	2,892	-	-	16,677	444	-	-	-	717,088	29,114	-
2b.1.2.7	Emergency Diesel Generator	-	129	-	-	-	-	-	19	148	-	-	148	-	-	-	-	-	-	2,066	-
2b.1.2.8	Essential Service Water RCA	-	297	21	25	72	74	-	109	599	599	-	-	3,797	699	-	-	-	216,933	4,447	-
2b.1.2.9	Fire Protection	-	122	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	1,984	-
2b.1.2.10	Fire Protection RCA	-	180	8	6	10	29	-	55	288	288	-	-	500	274	-	-	-	44,875	2,593	-
2b.1.2.11	HVAC-Auxiliary Building	-	540	11	18	91	15	-	156	832	832	-	-	4,772	143	-	-	-	206,582	8,219	-
2b.1.2.12	HVAC-Diesel Generator Room	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	682	-
2b.1.2.13	HVAC-Miscellaneous	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	656	-
2b.1.2.14	HVAC-Primary Containment	-	654	23	39	194	29	-	208	1,145	1,145	-	-	10,145	270	-	-	-	436,230	9,906	-
2b.1.2.15	HVAC-Turbine Building	-	187	-	-	-	-	-	28	215	-	-	215	-	-	-	-	-	-	3,177	-
2b.1.2.16	Instrument Air Supply	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	760	-
2b.1.2.17	Instrument Air Supply RCA	-	73	4	3	2	15	-	23	120	120	-	-	86	143	-	-	-	16,339	1,082	-
2b.1.2.18	Miscellaneous Drains	-	43	2	2	3	7	-	13	70	70	-	-	176	69	-	-	-	13,320	655	-
2b.1.2.19	Primary Containment Purge	-	304	23	27	87	70	-	113	624	624	-	-	4,544	664	-	-	-	244,109	4,845	-
2b.1.2.20	Primary Water	-	65	2	1	2	7	-	19	97	97	-	-	90	69	-	-	-	9,849	1,024	-
2b.1.2.21	Radioactive Waste Disposal	471	997	63	47	53	231	-	564	2,427	2,427	-	-	2,795	2,520	-	-	-	309,487	22,364	-
2b.1.2.22	Reactor Building Equipment Drains	89	107	8	6	2	34	-	81	326	326	-	-	82	330	-	-	-	32,558	2,742	-
2b.1.2.23	Reactor Building Floor Drains	20	50	3	2	1	11	-	26	112	112	-	-	76	102	-	-	-	12,182	1,034	-
2b.1.2.24	Reactor Coolant	-	187	10	7	2	40	-	59	304	304	-	-	101	378	-	-	-	38,001	2,806	-
2b.1.2.25	Residual Heat Removal	150	211	16	15	17	76	-	153	637	637	-	-	867	716	-	-	-	99,415	4,227	-
2b.1.2.26	Safety Injection	-	958	65	61	128	236	-	333	1,781	1,781	-	-	6,698	2,507	-	-	-	472,191	15,122	-
2b.1.2.27	Station Air RCA	-	36	2	1	1	7	-	11	58	58	-	-	39	69	-	-	-	7,800	525	-
2b.1.2.28	Station Heating RCA	-	120	7	7	15	25	-	40	214	214	-	-	789	238	-	-	-	53,393	1,772	-
2b.1.2.29	Waste Oil Sumps RCA	-	7	1	0	0	2	-	2	13	13	-	-	13	20	-	-	-	2,298	93	-
2b.1.2	Totals	1,624	13,753	459	473	1,310	1,501	-	4,577	23,698	19,539	-	4,159	68,636	14,839	-	-	-	4,059,664	235,048	-
2b.1.3	Scaffolding in support of decommissioning	-	1,654	9	2	10	3	-	417	2,095	2,095	-	-	458	29	-	-	-	23,188	28,306	-
Decontamination of Site Buildings																					
2b.1.4.1	Reactor	2,160	1,635	200	210	134	786	-	1,757	6,883	6,883	-	-	7,022	9,990	-	-	-	1,229,600	57,951	-
2b.1.4.2	Auxiliary Building	217	135	10	11	17	23	-	154	567	567	-	-	866	426	-	-	-	76,806	5,404	-
2b.1.4.3	Refueling Water Storage Tank	396	470	5	6	22	9	-	322	1,231	1,231	-	-	1,146	142	-	-	-	60,369	13,578	-
2b.1.4.4	Steam Generator Storage Facility	63	0	0	0	0	0	-	32	95	95	-	-	1	0	-	-	-	40	993	-
2b.1.4	Totals	2,836	2,241	215	227	172	819	-	2,265	8,776	8,776	-	-	9,034	10,558	-	-	-	1,366,815	77,926	-
2b.1	Subtotal Period 2b Activity Costs	4,460	17,648	684	703	1,492	2,323	-	7,259	34,569	30,411	-	4,159	78,129	25,425	-	-	-	5,449,667	341,281	-
Period 2b Additional Costs																					
2b.2.1	License Termination Survey Planning	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
2b.2	Subtotal Period 2b Additional Costs	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
Period 2b Collateral Costs																					
2b.3.1	Process liquid waste	207	-	157	717	-	923	-	458	2,462	2,462	-	-	-	2,437	-	-	-	198,975	475	-
2b.3.2	Small tool allowance	-	350	-	-	-	-	-	53	403	403	-	-	-	-	-	-	-	-	-	-
2b.3.3	Decommissioning Equipment Disposition	-	-	123	34	127	40	-	46	369	369	-	-	6,000	373	-	-	-	303,507	88	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	21,000	3,150	24,150	-	24,150	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	207	350	279	751	127	963	21,000	3,706	27,384	3,234	24,150	-	6,000	2,811	-	-	-	502,482	563	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	725	-	-	-	-	-	-	181	907	907	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	850	85	935	935	-	-	-	-	-	-	-	-	-	-

Table C-1
Braidwood Nuclear Power Station, 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 2b Period-Dependent Costs (continued)																					
2b.4.3	Property taxes	-	-	-	-	-	-	1,264	126	1,390	1,390	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,318	-	-	-	-	-	579	2,897	2,897	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,450	-	-	-	-	-	668	5,118	5,118	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	15	5	-	276	-	71	367	367	-	-	-	4,949	-	-	-	98,975	23	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,502	375	2,877	2,877	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,664	166	1,831	1,831	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	253	25	278	-	278	-	-	-	-	-	-	-	-	-
2b.4.10	Site O&M Costs	-	-	-	-	-	-	316	47	363	363	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	964	145	1,109	-	1,109	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	484	73	557	557	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	111	17	128	-	128	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	1,103	165	1,269	1,269	-	-	-	-	-	-	-	-	-	29,009
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	22,006	3,301	25,307	25,307	-	-	-	-	-	-	-	-	-	284,811
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	37,787	5,668	43,455	43,455	-	-	-	-	-	-	-	-	-	530,066
2b.4	Subtotal Period 2b Period-Dependent Costs	725	6,768	15	5	-	276	69,303	11,694	88,786	87,272	1,514	-	-	4,949	-	-	-	98,975	23	843,886
2b.0	TOTAL PERIOD 2b COST	5,393	24,766	978	1,459	1,619	3,562	91,243	22,941	151,961	122,138	25,664	4,159	84,129	33,184	-	-	-	6,051,124	341,867	850,126
PERIOD 2d - Delay before License Termination																					
Period 2d Period-Dependent Costs																					
2d.4.1	Insurance	-	-	-	-	-	-	627	63	690	690	-	-	-	-	-	-	-	-	-	-
2d.4.2	Property taxes	-	-	-	-	-	-	932	93	1,025	1,025	-	-	-	-	-	-	-	-	-	-
2d.4.3	Health physics supplies	-	142	-	-	-	-	-	35	177	177	-	-	-	-	-	-	-	-	-	-
2d.4.4	Disposal of DAW generated	-	-	1	0	-	10	-	3	14	14	-	-	-	186	-	-	-	3,720	1	-
2d.4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2d.4.6	NRC Fees	-	-	-	-	-	-	340	34	374	374	-	-	-	-	-	-	-	-	-	-
2d.4.7	Emergency Planning Fees	-	-	-	-	-	-	186	19	205	-	205	-	-	-	-	-	-	-	-	-
2d.4.8	Site O&M Costs	-	-	-	-	-	-	233	35	268	268	-	-	-	-	-	-	-	-	-	-
2d.4.9	ISFSI Operating Costs	-	-	-	-	-	-	82	12	94	-	94	-	-	-	-	-	-	-	-	-
2d.4.10	Security Staff Cost	-	-	-	-	-	-	444	67	510	510	-	-	-	-	-	-	-	-	-	11,674
2d.4.11	Utility Staff Cost	-	-	-	-	-	-	1,917	288	2,205	2,205	-	-	-	-	-	-	-	-	-	27,240
2d.4	Subtotal Period 2d Period-Dependent Costs	-	142	1	0	-	10	4,762	648	5,563	5,264	299	-	-	186	-	-	-	3,720	1	38,914
2d.0	TOTAL PERIOD 2d COST	-	142	1	0	-	10	4,762	648	5,563	5,264	299	-	-	186	-	-	-	3,720	1	38,914
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	-	-	-	-	-	-	6,204	1,861	8,065	8,065	-	-	-	-	-	-	-	-	97,350	3,120
2e.2	Subtotal Period 2e Additional Costs	-	-	-	-	-	-	6,204	1,861	8,065	8,065	-	-	-	-	-	-	-	-	97,350	3,120
Period 2e Collateral Costs																					
2e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 2e Period-Dependent Costs																					
2e.4.1	Insurance	-	-	-	-	-	-	229	23	252	252	-	-	-	-	-	-	-	-	-	-
2e.4.2	Property taxes	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
2e.4.3	Health physics supplies	-	629	-	-	-	-	-	157	786	786	-	-	-	-	-	-	-	-	-	-
2e.4.4	Disposal of DAW generated	-	-	1	0	-	19	-	5	25	25	-	-	-	337	-	-	-	6,734	2	-
2e.4.5	Plant energy budget	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
2e.4.6	NRC Fees	-	-	-	-	-	-	532	53	585	585	-	-	-	-	-	-	-	-	-	-

Table C-1
Braidwood Nuclear Power Station, 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.4.7	Emergency Planning Fees	-	-	-	-	-	-	75	8	83	-	83	-	-	-	-	-	-	-	-	-
2e.4.8	Site O&M Costs	-	-	-	-	-	-	94	14	108	108	-	-	-	-	-	-	-	-	-	-
2e.4.9	ISFSI Operating Costs	-	-	-	-	-	-	33	5	38	-	38	-	-	-	-	-	-	-	-	-
2e.4.10	Security Staff Cost	-	-	-	-	-	-	1,192	179	1,371	1,371	-	-	-	-	-	-	-	-	-	27,893
2e.4.11	DOC Staff Cost	-	-	-	-	-	-	3,801	570	4,371	4,371	-	-	-	-	-	-	-	-	-	46,750
2e.4.12	Utility Staff Cost	-	-	-	-	-	-	4,795	719	5,514	5,514	-	-	-	-	-	-	-	-	-	60,107
2e.4	Subtotal Period 2e Period-Dependent Costs	-	629	1	0	-	19	11,326	1,800	13,776	13,655	121	-	-	337	-	-	-	6,734	2	134,750
2e.0	TOTAL PERIOD 2e COST	-	629	1	0	-	19	18,811	3,876	23,337	23,216	121	-	-	337	-	-	-	6,734	97,352	137,870
PERIOD 2 TOTALS		7,370	52,076	13,063	9,308	3,442	30,982	190,904	62,912	370,058	318,663	41,916	9,479	192,795	100,937	3,156	459	-	17,963,210	715,746	1,718,283
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	6,763	-	-	-	-	-	1,014	7,778	-	-	7,778	-	-	-	-	-	-	69,546	-
3b.1.1.2	Auxiliary Building	-	5,798	-	-	-	-	-	870	6,667	-	-	6,667	-	-	-	-	-	-	61,037	-
3b.1.1.3	Refueling Water Storage Tank	-	1,028	-	-	-	-	-	154	1,182	-	-	1,182	-	-	-	-	-	-	11,692	-
3b.1.1.4	Steam Generator Storage Facility	-	429	-	-	-	-	-	64	493	-	-	493	-	-	-	-	-	-	4,559	-
3b.1.1.5	Turbine Building	-	5,769	-	-	-	-	-	865	6,634	-	-	6,634	-	-	-	-	-	-	70,342	-
3b.1.1.6	Turbine Pedestal	-	1,352	-	-	-	-	-	203	1,555	-	-	1,555	-	-	-	-	-	-	12,628	-
3b.1.1	Totals	-	21,138	-	-	-	-	-	3,171	24,309	-	-	24,309	-	-	-	-	-	-	229,805	-
Site Closeout Activities																					
3b.1.2	Grade & landscape site	-	716	-	-	-	-	-	107	823	-	-	823	-	-	-	-	-	-	1,942	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	184	28	212	212	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	21,854	-	-	-	-	184	3,306	25,343	212	-	25,132	-	-	-	-	-	-	231,747	1,560
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	603	-	-	-	-	3	91	697	-	-	697	-	-	-	-	-	-	2,798	-
3b.2	Subtotal Period 3b Additional Costs	-	603	-	-	-	-	3	91	697	-	-	697	-	-	-	-	-	-	2,798	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	256	-	-	-	-	-	38	294	-	-	294	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	256	-	-	-	-	-	38	294	-	-	294	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	754	75	829	-	829	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	1,239	124	1,363	-	1,363	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,239	-	-	-	-	-	936	7,174	-	-	7,174	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	327	49	376	-	75	301	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	244	24	268	-	268	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	248	25	273	-	273	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	109	16	125	-	125	-	-	-	-	-	-	-	-	-
3b.4.8	Site O&M Cost	-	-	-	-	-	-	310	46	356	-	-	356	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	3,751	563	4,313	(0)	3,537	776	-	-	-	-	-	-	-	87,294
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	11,650	1,748	13,398	-	-	13,398	-	-	-	-	-	-	-	137,043
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	7,035	1,055	8,090	(0)	1,537	6,553	-	-	-	-	-	-	-	87,294
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,239	-	-	-	-	25,665	4,661	36,565	(0)	8,007	28,558	-	-	-	-	-	-	-	311,630
3b.0	TOTAL PERIOD 3b COST	-	28,952	-	-	-	-	25,852	8,096	62,900	212	8,007	54,682	-	-	-	-	-	-	234,545	313,190

Table C-1
Braidwood Nuclear Power Station, 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 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,500	1,125	8,625	-	8,625	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	7,500	1,125	8,625	-	8,625	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	2,619	262	2,881	-	2,881	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	4,307	431	4,737	-	4,737	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	1,269	127	1,396	-	1,396	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	861	86	947	-	947	-	-	-	-	-	-	-	-	-
3c.4.6	Site O&M Costs	-	-	-	-	-	-	1,077	161	1,238	-	1,238	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	379	57	436	-	436	-	-	-	-	-	-	-	-	-
3c.4.8	Security Staff Cost	-	-	-	-	-	-	10,731	1,610	12,341	-	12,341	-	-	-	-	-	-	-	-	242,691
3c.4.9	Utility Staff Cost	-	-	-	-	-	-	4,656	698	5,354	-	5,354	-	-	-	-	-	-	-	-	60,763
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	25,900	3,432	29,332	-	29,332	-	-	-	-	-	-	-	-	303,454
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	33,400	4,557	37,957	-	37,957	-	-	-	-	-	-	-	-	303,454
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	375	-	-	11,837	-	1,813	14,025	14,025	-	-	-	-	-	-	505	104,146	-	-
3d.1.1	Totals	-	-	375	-	-	11,837	-	1,813	14,025	14,025	-	-	-	-	-	-	505	104,146	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	375	-	-	11,837	-	1,813	14,025	14,025	-	-	-	-	-	-	505	104,146	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	12	1	13	-	13	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	19	2	21	-	21	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	7	1	8	-	8	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	4	0	4	-	4	-	-	-	-	-	-	-	-	-
3d.4.6	Site O&M Costs	-	-	-	-	-	-	5	1	6	-	6	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Security Staff Cost	-	-	-	-	-	-	48	7	55	-	55	-	-	-	-	-	-	-	-	1,080
3d.4.9	Utility Staff Cost	-	-	-	-	-	-	21	3	24	-	24	-	-	-	-	-	-	-	-	270
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	117	15	132	-	132	-	-	-	-	-	-	-	-	1,350
3d.0	TOTAL PERIOD 3d COST	-	-	375	-	-	11,837	117	1,829	14,158	14,025	132	-	-	-	-	-	505	104,146	-	1,350
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	ISFSI License Termination	-	41	1	24	-	90	719	143	1,017	-	1,017	-	-	1,703	-	-	-	142,573	2,775	1,280
3e.2	Subtotal Period 3e Additional Costs	-	41	1	24	-	90	719	143	1,017	-	1,017	-	-	1,703	-	-	-	142,573	2,775	1,280
Period 3e Collateral Costs																					
3e.3.1	Small tool allowance	-	1	-	-	-	-	-	0	1	-	1	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	1	-	-	-	-	-	0	1	-	1	-	-	-	-	-	-	-	-	-

Table C-1
Braidwood Nuclear Power Station, 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 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	99	10	109	-	109	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	163	16	179	-	179	-	-	-	-	-	-	-	-	-
3e.4.3	Heavy equipment rental	-	222	-	-	-	-	-	33	256	-	256	-	-	-	-	-	-	-	-	-
3e.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3e.4.5	Site O&M Costs	-	-	-	-	-	-	41	6	47	-	47	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	109	16	125	-	125	-	-	-	-	-	-	-	-	2,468
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	147	22	169	-	169	-	-	-	-	-	-	-	-	1,870
3e.4	Subtotal Period 3e Period-Dependent Costs	-	222	-	-	-	-	559	104	885	-	885	-	-	-	-	-	-	-	-	4,338
3e.0	TOTAL PERIOD 3e COST	-	264	1	24	-	90	1,278	247	1,903	-	1,903	-	-	1,703	-	-	-	142,573	2,775	5,618
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	ISFSI Demolition and Site Restoration	-	1,303	-	-	-	-	24	199	1,527	-	1,527	-	-	-	-	-	-	-	16,256	80
3f.2	Subtotal Period 3f Additional Costs	-	1,303	-	-	-	-	24	199	1,527	-	1,527	-	-	-	-	-	-	-	16,256	80
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	18	-	-	-	-	-	3	20	-	20	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	18	-	-	-	-	-	3	20	-	20	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	86	9	95	-	95	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	91	-	-	-	-	-	14	105	-	105	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.5	Site O&M Costs	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-
3f.4.6	Security Staff Cost	-	-	-	-	-	-	58	9	66	-	66	-	-	-	-	-	-	-	-	1,307
3f.4.7	Utility Staff Cost	-	-	-	-	-	-	64	10	73	-	73	-	-	-	-	-	-	-	-	810
3f.4	Subtotal Period 3f Period-Dependent Costs	-	91	-	-	-	-	229	44	364	-	364	-	-	-	-	-	-	-	-	2,117
3f.0	TOTAL PERIOD 3f COST	-	1,412	-	-	-	-	253	245	1,910	-	1,910	-	-	-	-	-	-	-	16,256	2,197
PERIOD 3 TOTALS		-	30,627	376	24	-	11,927	60,900	14,975	118,828	14,237	49,909	54,682	-	1,703	-	-	505	246,719	253,576	625,810
TOTAL COST TO DECOMMISSION		10,285	85,095	13,523	9,709	3,442	46,342	361,819	97,071	627,287	442,250	119,415	65,622	192,795	103,983	4,045	459	505	18,350,470	1,001,139	3,180,868

Table C-1
Braidwood Nuclear Power Station, 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

TOTAL COST TO DECOMMISSION WITH 18.31% CONTINGENCY:	$627,287	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 70.5% OR:	$442,250	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 19.04% OR:	$119,415	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 10.46% OR:	$65,622	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	108,487	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	57,807	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,001,139	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
Braidwood Nuclear Power Station, 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 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	379	57	436	436	-	-	-	-	-	-	-	-	-	3,210
1a.1.13	Perform SER and EA	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,327
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	253	38	290	290	-	-	-	-	-	-	-	-	-	2,140
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	207	31	238	238	-	-	-	-	-	-	-	-	-	1,753
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	249	37	286	257	-	29	-	-	-	-	-	-	-	2,106
1a.1.17.2	Plant systems	-	-	-	-	-	-	210	32	242	218	-	24	-	-	-	-	-	-	-	1,783
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	359	54	412	412	-	-	-	-	-	-	-	-	-	3,039
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	328	49	378	378	-	-	-	-	-	-	-	-	-	2,782
1a.1.17.6	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	158	24	181	181	-	-	-	-	-	-	-	-	-	1,335
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	81	12	93	46	-	46	-	-	-	-	-	-	-	685
1a.1.17.9	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	158	24	181	91	-	91	-	-	-	-	-	-	-	1,335
1a.1.17.12	Waste management	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,911	287	2,197	1,935	-	262	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	121	18	139	139	-	-	-	-	-	-	-	-	-	1,027
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	8,725	1,309	10,034	9,771	-	262	-	-	-	-	-	-	-	31,566
Period 1a Additional Costs																					
1a.2.1	ISFSI Expansion	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	8,000	1,200	9,200	-	9,200	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	8,000	1,200	9,200	-	9,200	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	751	75	826	826	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	396	-	-	-	-	-	99	496	496	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	1	-	32	-	8	42	42	-	-	-	565	-	-	-	11,299	3	-

Table C-2
Braidwood Nuclear Power Station, 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 1a Period-Dependent Costs (continued)																					
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	471	47	518	518	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	315	32	347	-	347	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	381	57	438	-	438	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	6,337	950	7,287	7,287	-	-	-	-	-	-	-	-	-	157,471
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	24,828	3,724	28,552	28,552	-	-	-	-	-	-	-	-	-	346,229
1a.4	Subtotal Period 1a Period-Dependent Costs	-	817	2	1	-	32	34,571	5,279	40,700	39,865	836	-	-	565	-	-	-	11,299	3	503,700
1a.0	TOTAL PERIOD 1a COST	-	817	2	1	-	32	61,196	9,273	71,319	49,636	21,421	262	-	565	-	-	-	11,299	3	535,266
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	239	36	275	247	-	27	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	68	10	78	20	-	59	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	183	28	211	211	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.9	Facility closeout	-	-	-	-	-	-	61	9	70	35	-	35	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	51	8	58	29	-	29	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	79	12	91	-	-	91	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	79	12	91	-	-	91	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	138	21	159	143	-	16	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	138	21	159	143	-	16	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,679	252	1,931	1,568	-	363	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	574	-	-	-	-	-	-	287	861	861	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	574	-	-	-	-	-	1,679	539	2,792	2,429	-	363	-	-	-	-	-	-	1,067	14,228
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	2,657	797	3,454	3,454	-	-	-	-	-	-	-	-	12,779	4,547
1b.2.2	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	12,346	2,250	14,597	14,597	-	-	-	-	-	-	-	-	12,779	4,547
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process liquid waste	56	-	76	350	-	3,070	-	856	4,408	4,408	-	-	-	371	806	-	-	111,694	229	-
1b.3.4	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.5	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
1b.3.6	Decon rig	1,400	-	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
1b.3.7	Spent Fuel Capital and Transfer	-	-	-	-	-	-	4,000	600	4,600	-	4,600	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,267	1,102	76	350	-	3,070	5,130	2,122	14,117	9,517	4,600	-	-	371	806	-	-	111,694	229	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	25	-	-	-	-	-	-	6	31	31	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-

Table C-2
Braidwood Nuclear Power Station, 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 Period-Dependent Costs (continued)																					
1b.4.3	Property taxes	-	-	-	-	-	-	3,240	324	3,564	3,564	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	219	-	-	-	-	-	55	274	274	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	211	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	1	0	-	18	-	5	24	24	-	-	-	325	-	-	-	6,507	1	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,323	198	1,521	1,521	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	236	24	260	260	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	158	16	174	-	174	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	191	29	220	-	220	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	3,177	477	3,654	3,654	-	-	-	-	-	-	-	-	-	78,951
1b.4.14	DOC Staff Cost	-	-	-	-	-	-	3,689	553	4,242	4,242	-	-	-	-	-	-	-	-	-	47,057
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	12,448	1,867	14,315	14,315	-	-	-	-	-	-	-	-	-	173,589
1b.4	Subtotal Period 1b Period-Dependent Costs	25	430	1	0	-	18	24,923	3,635	29,032	28,614	419	-	-	325	-	-	-	6,507	1	299,597
1b.0	TOTAL PERIOD 1b COST	2,866	1,532	77	351	-	3,088	44,078	8,547	60,539	55,157	5,019	363	-	697	806	-	-	118,201	14,077	318,372
PERIOD 1 TOTALS		2,866	2,349	78	351	-	3,120	105,274	17,820	131,858	104,793	26,440	626	-	1,262	806	-	-	129,500	14,079	853,638
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	212	177	33	39	-	341	-	245	1,048	1,048	-	-	-	1,728	-	-	-	208,992	6,092	-
2a.1.1.2	Pressurizer Relief Tank	36	32	6	8	-	60	-	43	184	184	-	-	-	329	-	-	-	36,553	1,072	-
2a.1.1.3	Reactor Coolant Pumps & Motors	115	118	96	180	-	1,272	-	442	2,224	2,224	-	-	-	4,796	-	-	-	780,540	4,291	100
2a.1.1.4	Pressurizer	54	68	399	96	-	412	-	201	1,230	1,230	-	-	-	3,033	-	-	-	252,826	2,482	938
2a.1.1.5	Steam Generators	433	4,168	2,266	2,428	580	3,416	-	2,790	16,080	16,080	-	-	39,289	14,436	-	-	-	3,278,518	23,233	2,125
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	101	80	176	42	-	59	-	109	568	568	-	-	-	2,843	-	-	-	50,181	2,843	-
2a.1.1.7	Reactor Vessel Internals	140	2,193	4,483	893	-	8,060	233	7,123	23,125	23,125	-	-	-	1,377	903	459	-	326,029	26,933	1,209
2a.1.1.8	Reactor Vessel	106	4,162	1,501	691	-	7,847	233	7,681	22,220	22,220	-	-	-	6,606	2,254	-	-	978,589	26,933	1,209
2a.1.1	Totals	1,197	10,998	8,960	4,376	580	21,467	466	18,634	66,678	66,678	-	-	39,289	35,149	3,156	459	-	5,912,228	93,880	5,582
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	650	388	38	203	284	-	309	1,872	1,872	-	-	5,088	2,833	-	-	-	686,663	10,223	-
2a.1.3	Main Condensers	-	1,312	170	59	143	211	-	428	2,324	2,324	-	-	6,756	1,992	-	-	-	482,702	20,428	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	1,171	-	-	-	-	-	176	1,346	1,346	-	-	-	-	-	-	-	-	12,130	-
2a.1.4.2	Auxiliary Building	-	655	-	-	-	-	-	98	754	754	-	-	-	-	-	-	-	-	6,896	-
2a.1.4.3	Radwaste/Service Building	-	429	-	-	-	-	-	64	494	494	-	-	-	-	-	-	-	-	5,059	-
2a.1.4.4	Refueling Water Storage Tank	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,299	-
2a.1.4.5	Fuel Handling Building	-	337	-	-	-	-	-	51	388	388	-	-	-	-	-	-	-	-	3,690	-
2a.1.4	Totals	-	2,707	-	-	-	-	-	406	3,113	3,113	-	-	-	-	-	-	-	-	29,074	-
Disposal of Plant Systems																					
2a.1.5.1	Auxiliary Feedwater	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,143	-
2a.1.5.2	Auxiliary Steam	-	130	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,107	-
2a.1.5.3	Auxiliary Steam RCA	-	357	16	15	33	59	-	113	594	594	-	-	1,717	562	-	-	-	120,095	5,268	-
2a.1.5.4	Boric Acid Processing	466	511	36	27	20	145	-	408	1,612	1,612	-	-	1,071	1,516	-	-	-	166,316	14,426	-
2a.1.5.5	CO2 & H2	-	18	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	289	-
2a.1.5.6	CO2 & H2 RCA	-	34	2	2	3	6	-	11	58	58	-	-	170	61	-	-	-	12,266	482	-
2a.1.5.7	Chemical Feed	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	2,663	-
2a.1.5.8	Chemical Feed at Intake	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	364	-
2a.1.5.9	Chilled Water	-	91	-	-	-	-	-	14	104	-	-	104	-	-	-	-	-	-	1,454	-
2a.1.5.10	Circulating Water	-	542	-	-	-	-	-	81	624	-	-	624	-	-	-	-	-	-	8,814	-
2a.1.5.11	Condensate	-	333	-	-	-	-	-	50	383	-	-	383	-	-	-	-	-	-	5,317	-

Table C-2
Braidwood Nuclear Power Station, 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
Disposal of Plant Systems (continued)																					
2a.1.5.12	Condensate Booster	-	332	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	5,314	-
2a.1.5.13	Condensate Cleanup	-	182	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	3,000	-
2a.1.5.14	Containment Spray	-	251	17	18	49	56	-	88	478	478	-	-	2,569	527	-	-	-	151,430	3,698	-
2a.1.5.15	Diesel Fuel Oil	-	180	-	-	-	-	-	27	207	-	-	207	-	-	-	-	-	-	2,848	-
2a.1.5.16	Essential Service Water	-	311	-	-	-	-	-	47	358	-	-	358	-	-	-	-	-	-	5,049	-
2a.1.5.17	Extraction Steam	-	223	-	-	-	-	-	33	256	-	-	256	-	-	-	-	-	-	3,637	-
2a.1.5.18	Feedwater	-	303	-	-	-	-	-	45	348	-	-	348	-	-	-	-	-	-	4,925	-
2a.1.5.19	Feedwater Drains	-	719	-	-	-	-	-	108	827	-	-	827	-	-	-	-	-	-	11,719	-
2a.1.5.20	Gland Steam	-	38	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	616	-
2a.1.5.21	Gland Water	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	458	-
2a.1.5.22	Main Steam	-	308	-	-	-	-	-	46	354	-	-	354	-	-	-	-	-	-	4,979	-
2a.1.5.23	Main Steam RCA	-	84	4	5	13	17	-	28	152	152	-	-	670	162	-	-	-	41,728	1,256	-
2a.1.5.24	Make-up Demineralizer	-	155	-	-	-	-	-	23	179	-	-	179	-	-	-	-	-	-	2,595	-
2a.1.5.25	Nitrogen	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	18	-
2a.1.5.26	Non-Essential Service Water	-	361	-	-	-	-	-	54	416	-	-	416	-	-	-	-	-	-	5,903	-
2a.1.5.27	Non-Essential Service Water RCA	-	179	19	20	50	70	-	74	411	411	-	-	2,611	658	-	-	-	165,090	2,562	-
2a.1.5.28	Off Gas	-	734	35	38	96	128	-	239	1,271	1,271	-	-	5,026	1,212	-	-	-	312,797	11,268	-
2a.1.5.29	Potable Water	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	75	-
2a.1.5.30	Process Radiation Monitoring	-	72	1	1	1	3	-	19	98	98	-	-	75	33	-	-	-	5,961	1,214	-
2a.1.5.31	Process Sampling	-	160	3	3	9	9	-	44	229	229	-	-	466	89	-	-	-	26,924	2,632	-
2a.1.5.32	Screen Wash	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	740	-
2a.1.5.33	Station Air	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	705	-
2a.1.5.34	Station Heating	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	2,391	-
2a.1.5.35	Steam Humidification	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	115	-
2a.1.5.36	Switchgear Heat Removal	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	519	-
2a.1.5.37	Turbine Bldg Equip Drains	-	76	-	-	-	-	-	11	88	-	-	88	-	-	-	-	-	-	1,235	-
2a.1.5.38	Turbine Bldg Floor Drains	-	131	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,117	-
2a.1.5.39	Turbine Oil	-	83	-	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	1,359	-
2a.1.5.40	Turbine-Generator Auxilaries	-	56	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	884	-
2a.1.5.41	Waste Oil Sumps	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	517	-
2a.1.5.42	Well Water	-	79	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,247	-
2a.1.5	Totals	466	7,631	133	128	274	494	-	1,813	10,940	4,903	-	6,037	14,375	4,820	-	-	-	1,002,607	127,918	-
2a.1.6	Scaffolding in support of decommissioning	-	1,627	10	2	10	3	-	410	2,062	2,062	-	-	473	29	-	-	-	23,936	27,854	-
2a.1	Subtotal Period 2a Activity Costs	1,663	24,926	9,661	4,603	1,211	22,459	466	22,000	86,989	80,951	-	6,037	65,980	44,823	3,156	459	-	8,108,137	309,377	5,582
Period 2a Collateral Costs																					
2a.3.1	Process liquid waste	146	-	77	347	-	379	-	227	1,175	1,175	-	-	-	1,192	-	-	-	81,594	232	-
2a.3.2	Small tool allowance	-	316	-	-	-	-	-	47	363	327	-	36	-	-	-	-	-	-	-	-
2a.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	12,000	1,800	13,800	-	13,800	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	146	316	77	347	-	379	12,000	2,075	15,339	1,502	13,800	36	-	1,192	-	-	-	81,594	232	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	73	-	-	-	-	-	-	18	91	91	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	494	49	544	544	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	6,445	644	7,089	6,380	-	709	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,842	-	-	-	-	-	460	2,302	2,302	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,610	-	-	-	-	-	392	3,002	3,002	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	11	4	-	210	-	54	280	280	-	-	-	3,771	-	-	-	75,415	17	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	1,844	277	2,120	2,120	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	663	66	729	729	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	147	15	162	-	162	-	-	-	-	-	-	-	-	-
2a.4.10	Site O&M Costs	-	-	-	-	-	-	184	28	211	211	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	561	84	645	-	645	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	65	10	74	-	74	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	7,893	1,184	9,077	9,077	-	-	-	-	-	-	-	-	-	194,087
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	18,869	2,830	21,699	21,699	-	-	-	-	-	-	-	-	-	233,211

Table C-2
Braidwood Nuclear Power Station, 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 2a Period-Dependent Costs (continued)																					
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	32,045	4,807	36,852	36,852	-	-	-	-	-	-	-	-	-	431,073
2a.4	Subtotal Period 2a Period-Dependent Costs	73	4,452	11	4	-	210	69,209	10,918	84,878	83,288	881	709	-	3,771	-	-	-	75,415	17	858,371
2a.0	TOTAL PERIOD 2a COST	1,882	29,694	9,749	4,954	1,211	23,048	81,674	34,993	187,205	165,742	14,681	6,783	65,980	49,786	3,156	459	-	8,265,146	309,627	863,953
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Chemical & Volume Control	834	1,155	69	50	17	291	-	795	3,212	3,212	-	-	909	2,787	-	-	-	283,146	29,248	-
2b.1.1.2	Chilled Water RCA	-	647	48	43	71	191	-	232	1,233	1,233	-	-	3,736	1,808	-	-	-	313,840	9,257	-
2b.1.1.3	Component Cooling	-	687	45	47	121	160	-	242	1,302	1,302	-	-	6,342	1,513	-	-	-	393,115	10,143	-
2b.1.1.4	Electrical	-	4,168	-	-	-	-	-	625	4,793	-	-	4,793	-	-	-	-	-	-	66,259	-
2b.1.1.5	Electrical - Contaminated	-	1,896	20	35	172	25	-	514	2,663	2,663	-	-	9,033	240	-	-	-	388,394	28,801	-
2b.1.1.6	Electrical - RCA	-	2,460	48	78	389	57	-	704	3,737	3,737	-	-	20,387	542	-	-	-	876,577	37,570	-
2b.1.1.7	Emergency Diesel Generator	-	95	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	1,514	-
2b.1.1.8	Essential Service Water RCA	-	333	39	45	129	140	-	148	835	835	-	-	6,764	1,325	-	-	-	393,573	5,007	-
2b.1.1.9	Fire Protection	-	307	-	-	-	-	-	46	353	-	-	353	-	-	-	-	-	-	4,983	-
2b.1.1.10	Fire Protection RCA	-	521	36	36	76	137	-	185	990	990	-	-	3,961	1,298	-	-	-	277,242	7,443	-
2b.1.1.11	HVAC-Auxiliary Building	-	588	12	20	102	15	-	170	909	909	-	-	5,365	141	-	-	-	230,495	9,018	-
2b.1.1.12	HVAC-Control Room HVAC	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
2b.1.1.13	HVAC-Diesel Generator Room	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	686	-
2b.1.1.14	HVAC-Laboratory	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	315	-
2b.1.1.15	HVAC-Machine Shop	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	297	-
2b.1.1.16	HVAC-Primary Containment	-	654	23	39	194	29	-	208	1,145	1,145	-	-	10,145	270	-	-	-	436,230	9,906	-
2b.1.1.17	HVAC-Pumphouse	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	275	-
2b.1.1.18	HVAC-Radwaste	-	336	7	12	60	9	-	98	522	522	-	-	3,160	84	-	-	-	135,891	5,013	-
2b.1.1.19	HVAC-Turbine Building	-	186	-	-	-	-	-	28	214	-	-	214	-	-	-	-	-	-	3,158	-
2b.1.1.20	Instrument Air Supply	-	72	-	-	-	-	-	11	83	-	-	83	-	-	-	-	-	-	1,197	-
2b.1.1.21	Instrument Air Supply RCA	-	240	9	7	8	32	-	71	368	368	-	-	437	306	-	-	-	45,151	3,581	-
2b.1.1.22	Miscellaneous Drains	-	81	3	3	7	13	-	25	133	133	-	-	377	121	-	-	-	26,209	1,242	-
2b.1.1.23	Primary Containment Purge	-	321	23	27	85	73	-	118	647	647	-	-	4,466	687	-	-	-	242,950	5,082	-
2b.1.1.24	Primary Water	-	887	59	55	144	181	-	303	1,629	1,629	-	-	7,569	2,154	-	-	-	460,483	14,115	-
2b.1.1.25	Radioactive Waste Disposal	2,661	2,967	215	160	110	873	-	2,353	9,339	9,339	-	-	5,771	9,024	-	-	-	973,971	83,600	-
2b.1.1.26	Reactor Bldg Equipment Drains	109	116	10	8	3	47	-	98	392	392	-	-	170	446	-	-	-	46,524	2,908	-
2b.1.1.27	Reactor Building Floor Drains	19	44	2	2	1	10	-	24	103	103	-	-	75	92	-	-	-	11,255	942	-
2b.1.1.28	Reactor Coolant	-	177	9	6	2	37	-	56	288	288	-	-	104	351	-	-	-	35,666	2,678	-
2b.1.1.29	Residual Heat Removal	139	204	16	15	16	74	-	145	608	608	-	-	849	696	-	-	-	96,886	3,992	-
2b.1.1.30	Safety Injection	-	931	63	59	126	228	-	324	1,730	1,730	-	-	6,576	2,428	-	-	-	460,194	14,716	-
2b.1.1.31	Station Air RCA	-	56	3	2	1	12	-	18	93	93	-	-	69	115	-	-	-	13,089	822	-
2b.1.1.32	Station Heating RCA	-	244	15	14	26	56	-	83	437	437	-	-	1,372	529	-	-	-	103,157	3,574	-
2b.1.1.33	Waste Oil Sumps RCA	-	25	1	1	1	4	-	8	40	40	-	-	78	38	-	-	-	6,630	363	-
2b.1.1.34	Waste Water Treatment	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	1,464	-
2b.1.1	Totals	3,763	20,595	777	764	1,865	2,693	-	7,673	38,131	32,354	-	5,777	97,714	26,996	-	-	-	6,250,668	369,294	-
2b.1.2	Scaffolding in support of decommissioning	-	2,034	12	3	13	4	-	513	2,578	2,578	-	-	591	37	-	-	-	29,920	34,817	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	2,160	1,635	200	210	134	786	-	1,757	6,883	6,883	-	-	7,022	9,990	-	-	-	1,229,600	57,951	-
2b.1.3.2	Auxiliary Building	256	165	13	15	17	33	-	184	683	683	-	-	866	613	-	-	-	95,479	6,417	-
2b.1.3.3	Radwaste/Service Building	168	76	11	12	6	29	-	114	416	416	-	-	322	540	-	-	-	66,188	3,700	-
2b.1.3.4	Refueling Water Storage Tank	396	470	5	6	22	9	-	322	1,231	1,231	-	-	1,146	142	-	-	-	60,369	13,578	-
2b.1.3	Totals	2,980	2,346	230	243	179	858	-	2,377	9,213	9,213	-	-	9,355	11,284	-	-	-	1,451,636	81,646	-
2b.1	Subtotal Period 2b Activity Costs	6,743	24,975	1,019	1,010	2,056	3,555	-	10,563	49,921	44,145	-	5,777	107,661	38,317	-	-	-	7,732,224	485,757	-

Table C-2
Braidwood Nuclear Power Station, 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 2b Collateral Costs																					
2b.3.1	Process liquid waste	294	-	248	1,139	-	1,519	-	722	3,923	3,923	-	-	-	3,861	-	-	-	327,363	753	-
2b.3.2	Small tool allowance	-	498	-	-	-	-	-	75	573	573	-	-	-	-	-	-	-	-	-	-
2b.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	22,000	3,300	25,300	-	25,300	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	294	498	248	1,139	-	1,519	22,000	4,097	29,796	4,496	25,300	-	-	3,861	-	-	-	327,363	753	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	777	-	-	-	-	-	-	194	971	971	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	850	85	935	935	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	1,264	126	1,390	1,390	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,974	-	-	-	-	-	744	3,718	3,718	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,450	-	-	-	-	-	668	5,118	5,118	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	19	7	-	363	-	94	482	482	-	-	-	6,497	-	-	-	129,939	30	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,502	375	2,877	2,877	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,547	155	1,702	1,702	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	253	25	278	-	278	-	-	-	-	-	-	-	-	-
2b.4.10	Site O&M Costs	-	-	-	-	-	-	316	47	363	363	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,733	260	1,992	-	1,992	-	-	-	-	-	-	-	-	-
2b.4.12	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	484	73	557	557	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	111	17	128	-	128	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	13,567	2,035	15,602	15,602	-	-	-	-	-	-	-	-	-	333,599
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	31,199	4,680	35,879	35,879	-	-	-	-	-	-	-	-	-	385,023
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	53,549	8,032	61,581	61,581	-	-	-	-	-	-	-	-	-	714,666
2b.4	Subtotal Period 2b Period-Dependent Costs	777	7,424	19	7	-	363	107,374	17,609	133,573	131,175	2,398	-	-	6,497	-	-	-	129,939	30	1,433,287
2b.0	TOTAL PERIOD 2b COST	7,813	32,898	1,287	2,157	2,056	5,436	129,374	32,270	213,290	179,815	27,698	5,777	107,661	48,675	-	-	-	8,189,525	486,540	1,433,287
PERIOD 2c - Decontamination Following Wet Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Remove spent fuel racks	1,208	118	313	95	-	590	-	827	3,151	3,151	-	-	-	5,572	-	-	-	499,920	2,174	-
Disposal of Plant Systems																					
2c.1.2.1	Fuel Handling Bldg Equip Drains	-	177	11	9	14	38	-	58	307	307	-	-	738	397	-	-	-	62,254	2,688	-
2c.1.2.2	Fuel Handling Bldg Equip Drains (Unit 1)	-	32	1	1	1	5	-	10	49	49	-	-	37	49	-	-	-	5,918	475	-
2c.1.2.3	Fuel Handling Bldg Floor Drains	-	181	11	8	10	41	-	59	312	312	-	-	524	409	-	-	-	56,293	2,736	-
2c.1.2.4	Fuel Handling Bldg Floor Drains (Unit 1)	-	126	7	5	9	24	-	40	212	212	-	-	465	245	-	-	-	39,201	1,954	-
2c.1.2.5	Fuel Pool Cooling & Cleanup	-	241	15	14	16	67	-	83	435	435	-	-	830	635	-	-	-	90,354	3,663	-
2c.1.2.6	Fuel Pool Cooling & Cleanup (Unit 1)	-	223	14	13	15	61	-	77	403	403	-	-	805	578	-	-	-	84,182	3,417	-
2c.1.2.7	HVAC-Miscellaneous	-	110	-	-	-	-	-	17	127	-	-	127	-	-	-	-	-	-	1,769	-
2c.1.2.8	Tritium ALPS	106	403	15	20	90	26	-	178	838	838	-	-	4,691	293	-	-	-	212,816	8,043	-
2c.1.2	Totals	106	1,493	75	70	154	262	-	522	2,682	2,556	-	127	8,091	2,607	-	-	-	551,018	24,744	-
Decontamination of Site Buildings																					
2c.1.3.1	Fuel Handling Building	1,130	1,306	21	24	59	43	-	917	3,501	3,501	-	-	3,097	736	-	-	-	198,355	38,107	-
2c.1.3	Totals	1,130	1,306	21	24	59	43	-	917	3,501	3,501	-	-	3,097	736	-	-	-	198,355	38,107	-
2c.1.4	Scaffolding in support of decommissioning	-	407	2	1	3	1	-	103	516	516	-	-	118	7	-	-	-	5,984	6,963	-
2c.1	Subtotal Period 2c Activity Costs	2,444	3,324	411	190	216	897	-	2,368	9,850	9,723	-	127	11,307	8,922	-	-	-	1,255,277	71,989	-
Period 2c Additional Costs																					
2c.2.1	License Termination Survey Planning	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
2c.2	Subtotal Period 2c Additional Costs	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
Period 2c Collateral Costs																					
2c.3.1	Process liquid waste	188	-	83	374	-	360	-	249	1,254	1,254	-	-	-	1,294	-	-	-	77,612	252	-
2c.3.2	Small tool allowance	-	94	-	-	-	-	-	14	108	108	-	-	-	-	-	-	-	-	-	-
2c.3.3	Decommissioning Equipment Disposition	-	-	123	34	127	40	-	46	369	369	-	-	6,000	373	-	-	-	303,507	88	-

Table C-2
Braidwood Nuclear Power Station, 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
2c.3	Subtotal Period 2c Collateral Costs	188	94	206	407	127	400	-	309	1,731	1,731	-	-	6,000	1,667	-	-	-	381,119	340	-
Period 2c Period-Dependent Costs																					
2c.4.1	Decon supplies	159	-	-	-	-	-	-	40	199	199	-	-	-	-	-	-	-	-	-	-
2c.4.2	Insurance	-	-	-	-	-	-	234	23	257	257	-	-	-	-	-	-	-	-	-	-
2c.4.3	Property taxes	-	-	-	-	-	-	348	35	382	382	-	-	-	-	-	-	-	-	-	-
2c.4.4	Health physics supplies	-	549	-	-	-	-	-	137	686	686	-	-	-	-	-	-	-	-	-	-
2c.4.5	Heavy equipment rental	-	1,225	-	-	-	-	-	184	1,408	1,408	-	-	-	-	-	-	-	-	-	-
2c.4.6	Disposal of DAW generated	-	-	5	2	-	91	-	23	120	120	-	-	-	1,622	-	-	-	32,443	7	-
2c.4.7	Plant energy budget	-	-	-	-	-	-	367	55	422	422	-	-	-	-	-	-	-	-	-	-
2c.4.8	NRC Fees	-	-	-	-	-	-	328	33	361	361	-	-	-	-	-	-	-	-	-	-
2c.4.9	Emergency Planning Fees	-	-	-	-	-	-	70	7	76	-	76	-	-	-	-	-	-	-	-	-
2c.4.10	Site O&M Costs	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	-
2c.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	267	40	307	307	-	-	-	-	-	-	-	-	-	-
2c.4.12	ISFSI Operating Costs	-	-	-	-	-	-	31	5	35	-	35	-	-	-	-	-	-	-	-	-
2c.4.13	Security Staff Cost	-	-	-	-	-	-	2,078	312	2,389	2,389	-	-	-	-	-	-	-	-	-	48,260
2c.4.14	DOC Staff Cost	-	-	-	-	-	-	5,932	890	6,821	6,821	-	-	-	-	-	-	-	-	-	72,571
2c.4.15	Utility Staff Cost	-	-	-	-	-	-	10,842	1,626	12,468	12,468	-	-	-	-	-	-	-	-	-	138,611
2c.4	Subtotal Period 2c Period-Dependent Costs	159	1,773	5	2	-	91	20,582	3,422	26,033	25,921	112	-	-	1,622	-	-	-	32,443	7	259,443
2c.0	TOTAL PERIOD 2c COST	2,792	5,192	621	599	343	1,387	21,522	6,382	38,836	38,598	112	127	17,307	12,211	-	-	-	1,668,839	72,336	265,683
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	-	-	-	-	-	-	8,222	2,467	10,688	10,688	-	-	-	-	-	-	-	-	131,983	3,120
2e.2	Subtotal Period 2e Additional Costs	-	-	-	-	-	-	8,222	2,467	10,688	10,688	-	-	-	-	-	-	-	-	131,983	3,120
Period 2e Collateral Costs																					
2e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 2e Period-Dependent Costs																					
2e.4.1	Insurance	-	-	-	-	-	-	229	23	252	252	-	-	-	-	-	-	-	-	-	-
2e.4.2	Property taxes	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
2e.4.3	Health physics supplies	-	764	-	-	-	-	-	191	955	955	-	-	-	-	-	-	-	-	-	-
2e.4.4	Disposal of DAW generated	-	-	1	0	-	19	-	5	25	25	-	-	-	337	-	-	-	6,734	2	-
2e.4.5	Plant energy budget	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
2e.4.6	NRC Fees	-	-	-	-	-	-	355	35	390	390	-	-	-	-	-	-	-	-	-	-
2e.4.7	Emergency Planning Fees	-	-	-	-	-	-	75	8	83	-	83	-	-	-	-	-	-	-	-	-
2e.4.8	Site O&M Costs	-	-	-	-	-	-	94	14	108	108	-	-	-	-	-	-	-	-	-	-
2e.4.9	ISFSI Operating Costs	-	-	-	-	-	-	33	5	38	-	38	-	-	-	-	-	-	-	-	-
2e.4.10	Security Staff Cost	-	-	-	-	-	-	1,192	179	1,371	1,371	-	-	-	-	-	-	-	-	-	27,893
2e.4.11	DOC Staff Cost	-	-	-	-	-	-	3,801	570	4,371	4,371	-	-	-	-	-	-	-	-	-	46,750
2e.4.12	Utility Staff Cost	-	-	-	-	-	-	4,795	719	5,514	5,514	-	-	-	-	-	-	-	-	-	60,107
2e.4	Subtotal Period 2e Period-Dependent Costs	-	764	1	0	-	19	11,149	1,817	13,750	13,629	121	-	-	337	-	-	-	6,734	2	134,750
2e.0	TOTAL PERIOD 2e COST	-	764	1	0	-	19	20,652	4,498	25,935	25,814	121	-	-	337	-	-	-	6,734	131,985	137,870
PERIOD 2 TOTALS		12,487	68,548	11,658	7,710	3,610	29,890	253,222	78,142	465,266	409,969	42,612	12,686	190,948	111,009	3,156	459	-	18,130,240	1,000,488	2,700,793

Table C-2
Braidwood Nuclear Power Station, 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 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	6,763	-	-	-	-	-	1,014	7,778	-	-	7,778	-	-	-	-	-	-	69,546	-
3b.1.1.2	Aux Feedwater-Steam Tunnel/Penetr. Area	-	689	-	-	-	-	-	103	792	-	-	792	-	-	-	-	-	-	5,186	-
3b.1.1.3	Auxiliary Building	-	5,899	-	-	-	-	-	885	6,784	-	-	6,784	-	-	-	-	-	-	62,063	-
3b.1.1.4	Blowdown Outfall Structure	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	295	-
3b.1.1.5	Bottled Gas Storage	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	340	-
3b.1.1.6	Circulating Water Discharge	-	233	-	-	-	-	-	35	268	-	-	268	-	-	-	-	-	-	2,887	-
3b.1.1.7	Gatehouse and Extension	-	333	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	4,193	-
3b.1.1.8	Instrument Maintenance Building	-	94	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	1,190	-
3b.1.1.9	Lake Screen House	-	1,494	-	-	-	-	-	224	1,718	-	-	1,718	-	-	-	-	-	-	15,283	-
3b.1.1.10	Make-up Demineralizer Area	-	647	-	-	-	-	-	97	744	-	-	744	-	-	-	-	-	-	8,158	-
3b.1.1.11	Miscellaneous Warehouses	-	1,991	-	-	-	-	-	299	2,290	-	-	2,290	-	-	-	-	-	-	26,794	-
3b.1.1.12	Miscellaneous Yard Structures	-	1,254	-	-	-	-	-	188	1,442	-	-	1,442	-	-	-	-	-	-	14,693	-
3b.1.1.13	Radwaste/Service Building	-	3,927	-	-	-	-	-	589	4,516	-	-	4,516	-	-	-	-	-	-	45,685	-
3b.1.1.14	Receiving Building	-	183	-	-	-	-	-	27	210	-	-	210	-	-	-	-	-	-	2,292	-
3b.1.1.15	Refueling Water Storage Tank	-	1,028	-	-	-	-	-	154	1,182	-	-	1,182	-	-	-	-	-	-	11,692	-
3b.1.1.16	River Screen House	-	616	-	-	-	-	-	92	708	-	-	708	-	-	-	-	-	-	6,844	-
3b.1.1.17	Security Modifications	-	959	-	-	-	-	-	144	1,103	-	-	1,103	-	-	-	-	-	-	6,939	-
3b.1.1.18	Sewage Treatment Plant	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,326	-
3b.1.1.19	Tech Support Center & Cond Cleanup Bldg	-	499	-	-	-	-	-	75	574	-	-	574	-	-	-	-	-	-	6,095	-
3b.1.1.20	Turbine Building	-	5,769	-	-	-	-	-	865	6,634	-	-	6,634	-	-	-	-	-	-	70,342	-
3b.1.1.21	Turbine Pedestal	-	1,352	-	-	-	-	-	203	1,555	-	-	1,555	-	-	-	-	-	-	12,628	-
3b.1.1.22	Waste Treatment Building	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	1,265	-
3b.1.1.23	Fuel Handling Building	-	3,039	-	-	-	-	-	456	3,495	-	-	3,495	-	-	-	-	-	-	33,245	-
3b.1.1	Totals	-	37,032	-	-	-	-	-	5,555	42,587	-	-	42,587	-	-	-	-	-	-	408,981	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	237	-	-	-	-	-	35	272	-	-	272	-	-	-	-	-	-	1,367	-
3b.1.3	Grade & landscape site	-	716	-	-	-	-	-	107	823	-	-	823	-	-	-	-	-	-	1,942	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	79	12	91	91	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	37,984	-	-	-	-	79	5,709	43,772	91	-	43,681	-	-	-	-	-	-	412,290	668
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	1,020	-	-	-	-	5	154	1,179	-	-	1,179	-	-	-	-	-	-	4,730	-
3b.2.2	Cofferdam Construction and Teardown	-	778	-	-	-	-	-	117	894	-	-	894	-	-	-	-	-	-	7,391	-
3b.2	Subtotal Period 3b Additional Costs	-	1,798	-	-	-	-	5	270	2,074	-	-	2,074	-	-	-	-	-	-	12,121	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	459	-	-	-	-	-	69	528	-	-	528	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	459	-	-	-	-	-	69	528	-	-	528	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	754	75	829	-	829	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	1,239	124	1,363	-	1,363	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,239	-	-	-	-	-	936	7,174	-	-	7,174	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	327	49	376	-	75	301	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	244	24	268	-	268	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	248	25	273	-	273	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	109	16	125	-	125	-	-	-	-	-	-	-	-	-
3b.4.8	Site O&M Cost	-	-	-	-	-	-	310	46	356	-	-	356	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	3,751	563	4,313	(0)	3,537	776	-	-	-	-	-	-	-	87,294
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	11,650	1,748	13,398	-	-	13,398	-	-	-	-	-	-	-	137,043
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	7,035	1,055	8,090	(0)	1,537	6,553	-	-	-	-	-	-	-	87,294
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,239	-	-	-	-	25,665	4,661	36,565	(0)	8,007	28,558	-	-	-	-	-	-	-	311,630

Table C-2
Braidwood Nuclear Power Station, 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
3b.0	TOTAL PERIOD 3b COST	-	46,479	-	-	-	-	25,749	10,710	82,939	91	8,007	74,841	-	-	-	-	-	-	424,411	312,298
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,375	1,106	8,481	-	8,481	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	7,375	1,106	8,481	-	8,481	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	2,619	262	2,881	-	2,881	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	4,307	431	4,737	-	4,737	-	-	-	-	-	-	-	-	-
3c.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	1,269	127	1,396	-	1,396	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	861	86	947	-	947	-	-	-	-	-	-	-	-	-
3c.4.6	Site O&M Costs	-	-	-	-	-	-	1,077	161	1,238	-	1,238	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	379	57	436	-	436	-	-	-	-	-	-	-	-	-
3c.4.8	Security Staff Cost	-	-	-	-	-	-	10,731	1,610	12,341	-	12,341	-	-	-	-	-	-	-	-	242,691
3c.4.9	Utility Staff Cost	-	-	-	-	-	-	4,656	698	5,354	-	5,354	-	-	-	-	-	-	-	-	60,763
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	25,900	3,432	29,332	-	29,332	-	-	-	-	-	-	-	-	303,454
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	33,275	4,538	37,813	-	37,813	-	-	-	-	-	-	-	-	303,454
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	375	-	-	11,837	-	1,813	14,025	14,025	-	-	-	-	-	-	505	104,146	-	-
3d.1.1	Totals	-	-	375	-	-	11,837	-	1,813	14,025	14,025	-	-	-	-	-	-	505	104,146	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	375	-	-	11,837	-	1,813	14,025	14,025	-	-	-	-	-	-	505	104,146	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	12	1	13	-	13	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	19	2	21	-	21	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	7	1	8	-	8	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	4	0	4	-	4	-	-	-	-	-	-	-	-	-
3d.4.6	Site O&M Costs	-	-	-	-	-	-	5	1	6	-	6	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-
3d.4.8	Security Staff Cost	-	-	-	-	-	-	48	7	55	-	55	-	-	-	-	-	-	-	-	1,080
3d.4.9	Utility Staff Cost	-	-	-	-	-	-	21	3	24	-	24	-	-	-	-	-	-	-	-	270
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	117	15	132	-	132	-	-	-	-	-	-	-	-	1,350
3d.0	TOTAL PERIOD 3d COST	-	-	375	-	-	11,837	117	1,829	14,158	14,025	132	-	-	-	-	-	505	104,146	-	1,350
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	ISFSI License Termination	-	41	1	24	-	90	719	143	1,017	-	1,017	-	-	1,703	-	-	-	142,573	2,775	1,280
3e.2	Subtotal Period 3e Additional Costs	-	41	1	24	-	90	719	143	1,017	-	1,017	-	-	1,703	-	-	-	142,573	2,775	1,280
Period 3e Collateral Costs																					
3e.3.1	Small tool allowance	-	1	-	-	-	-	-	0	1	-	1	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	1	-	-	-	-	-	0	1	-	1	-	-	-	-	-	-	-	-	-

Table C-2
Braidwood Nuclear Power Station, 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 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	99	10	109	-	109	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	163	16	179	-	179	-	-	-	-	-	-	-	-	-
3e.4.3	Heavy equipment rental	-	222	-	-	-	-	-	33	256	-	256	-	-	-	-	-	-	-	-	-
3e.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3e.4.5	Site O&M Costs	-	-	-	-	-	-	41	6	47	-	47	-	-	-	-	-	-	-	-	-
3e.4.6	Security Staff Cost	-	-	-	-	-	-	109	16	125	-	125	-	-	-	-	-	-	-	-	2,468
3e.4.7	Utility Staff Cost	-	-	-	-	-	-	147	22	169	-	169	-	-	-	-	-	-	-	-	1,870
3e.4	Subtotal Period 3e Period-Dependent Costs	-	222	-	-	-	-	559	104	885	-	885	-	-	-	-	-	-	-	-	4,338
3e.0	TOTAL PERIOD 3e COST	-	264	1	24	-	90	1,278	247	1,903	-	1,903	-	-	1,703	-	-	-	142,573	2,775	5,618
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	ISFSI Demolition and Site Restoration	-	1,303	-	-	-	-	24	199	1,527	-	1,527	-	-	-	-	-	-	-	16,256	80
3f.2	Subtotal Period 3f Additional Costs	-	1,303	-	-	-	-	24	199	1,527	-	1,527	-	-	-	-	-	-	-	16,256	80
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	18	-	-	-	-	-	3	20	-	20	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	18	-	-	-	-	-	3	20	-	20	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	86	9	95	-	95	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	91	-	-	-	-	-	14	105	-	105	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.5	Site O&M Costs	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-
3f.4.6	Security Staff Cost	-	-	-	-	-	-	58	9	66	-	66	-	-	-	-	-	-	-	-	1,307
3f.4.7	Utility Staff Cost	-	-	-	-	-	-	64	10	73	-	73	-	-	-	-	-	-	-	-	810
3f.4	Subtotal Period 3f Period-Dependent Costs	-	91	-	-	-	-	229	44	364	-	364	-	-	-	-	-	-	-	-	2,117
3f.0	TOTAL PERIOD 3f COST	-	1,412	-	-	-	-	253	245	1,910	-	1,910	-	-	-	-	-	-	-	16,256	2,197
PERIOD 3 TOTALS		-	48,155	376	24	-	11,927	60,672	17,570	138,723	14,116	49,766	74,841	-	1,703	-	-	505	246,719	443,442	624,918
TOTAL COST TO DECOMMISSION		15,353	119,051	12,112	8,085	3,610	44,937	419,168	113,532	735,847	528,878	118,817	88,152	190,948	113,974	3,962	459	505	18,506,460	1,458,009	4,179,349

Table C-2
Braidwood Nuclear Power Station, 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

TOTAL COST TO DECOMMISSION WITH 18.24% CONTINGENCY:	$735,847	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 71.87% OR:	$528,878	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 16.15% OR:	$118,817	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 11.98% OR:	$88,152	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	118,395	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	76,913	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,458,009	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

DELAYED DECON

Page

Braidwood Nuclear Power Station, Unit 1 .....D-2

Braidwood Nuclear Power Station, Unit 2 .....D-13

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	398	119	517	517	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	177	27	204	204	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	590	89	679	679	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	581	87	668	668	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	492	74	565	565	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	1,913	287	2,199	2,199	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	140	21	161	161	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	142	21	163	163	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	281	42	323	323	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	4,633	755	5,388	5,388	-	-	-	-	-	-	-	-	-	35,890
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	751	75	826	826	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	421	-	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	706	71	776	776	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	315	32	347	-	347	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	381	57	438	-	438	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	12,264
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	31,082	4,662	35,745	35,745	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	842	2	1	-	34	35,189	5,367	41,434	40,599	836	-	-	610	-	-	-	12,190	3	435,664
1a.0	TOTAL PERIOD 1a COST	-	842	2	1	-	34	39,822	6,122	46,822	45,986	836	-	-	610	-	-	-	12,190	3	471,554

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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 - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	2,135	-	-	-	-	-	-	1,067	3,202	3,202	-	-	-	-	-	-	-	-	33,093	-
1b.1.1.2	Auxiliary Building	211	-	-	-	-	-	-	106	317	317	-	-	-	-	-	-	-	-	3,289	-
1b.1.1.3	Refueling Water Storage Tank	351	-	-	-	-	-	-	176	527	527	-	-	-	-	-	-	-	-	5,322	-
1b.1.1.4	Steam Generator Storage Facility	57	-	-	-	-	-	-	29	86	86	-	-	-	-	-	-	-	-	887	-
1b.1.1	Totals	2,754	-	-	-	-	-	-	1,377	4,131	4,131	-	-	-	-	-	-	-	-	42,591	-
1b.1	Subtotal Period 1b Activity Costs	2,754	-	-	-	-	-	-	1,377	4,131	4,131	-	-	-	-	-	-	-	-	42,591	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	185	-	81	364	-	351	-	243	1,223	1,223	-	-	-	1,259	-	-	-	75,560	246	-
1b.3.3	Small tool allowance	-	45	-	-	-	-	-	7	51	51	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	996	45	81	364	-	351	-	371	2,207	2,207	-	-	-	1,259	-	-	-	75,560	246	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	588	-	-	-	-	-	-	147	735	735	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	270	-	-	-	-	-	68	338	338	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	2	1	-	29	-	8	39	39	-	-	-	526	-	-	-	10,515	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	176	18	194	194	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	116	17	134	134	-	-	-	-	-	-	-	-	-	3,058
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,252	1,088	8,340	8,340	-	-	-	-	-	-	-	-	-	99,429
1b.4	Subtotal Period 1b Period-Dependent Costs	588	375	2	1	-	29	9,889	1,619	12,502	12,294	208	-	-	526	-	-	-	10,515	2	102,487
1b.0	TOTAL PERIOD 1b COST	4,338	420	83	364	-	380	9,889	3,367	18,840	18,632	208	-	-	1,785	-	-	-	86,076	42,839	102,487
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	457	-	-	-	-	-	69	525	525	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	13,416	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	69	10	79	79	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	504	-	-	-	-	802	306	1,612	1,612	-	-	-	-	-	-	-	-	17,116	583
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	150	-	66	296	-	285	-	197	995	995	-	-	-	1,024	-	-	-	61,469	200	-
1c.3.2	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	150	4	66	296	-	285	-	198	1,000	1,000	-	-	-	1,024	-	-	-	61,469	200	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	143	-	-	-	-	-	36	179	179	-	-	-	-	-	-	-	-	-	-

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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 1c Period-Dependent Costs (continued)																					
1c.4.4	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	6	-	1	7	7	-	-	-	99	-	-	-	1,976	0	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	176	18	194	194	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1c.4.9	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	116	17	134	134	-	-	-	-	-	-	-	-	-	3,058
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	1,073	161	1,234	1,234	-	-	-	-	-	-	-	-	-	13,520
1c.4	Subtotal Period 1c Period-Dependent Costs	-	248	0	0	-	6	3,709	507	4,470	4,261	208	-	-	99	-	-	-	1,976	0	16,578
1c.0	TOTAL PERIOD 1c COST	150	757	66	296	-	291	4,511	1,011	7,082	6,873	208	-	-	1,123	-	-	-	63,445	17,316	17,161
PERIOD 1 TOTALS		4,489	2,018	151	661	-	705	54,222	10,499	72,744	71,491	1,252	-	-	3,518	-	-	-	161,711	60,157	591,202
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	-	-	-	-	-	-	63	9	73	73	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	1,850	463	2,313	2,313	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,913	472	2,385	2,385	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	11,750	1,763	13,513	-	13,513	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	11,750	1,763	13,513	-	13,513	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	4,945	495	5,440	-	5,440	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	13,084	1,308	14,392	-	14,392	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	1,192	-	-	-	-	-	298	1,490	1,490	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	17	6	-	314	-	81	418	418	-	-	-	5,629	-	-	-	112,581	26	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	3,883	582	4,465	-	4,465	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	2,966	297	3,262	3,262	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,471	147	1,618	-	1,618	-	-	-	-	-	-	-	-	-
2a.4.8	Site O&M Costs	-	-	-	-	-	-	1,838	276	2,114	-	2,114	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	5,610	842	6,452	-	6,452	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	647	97	744	-	744	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	30,970	4,646	35,616	-	35,616	-	-	-	-	-	-	-	-	752,387
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	34,687	5,203	39,890	-	39,890	-	-	-	-	-	-	-	-	445,109
2a.4	Subtotal Period 2a Period-Dependent Costs	-	1,192	17	6	-	314	100,101	14,271	115,901	5,170	110,731	-	-	5,629	-	-	-	112,581	26	1,197,496
2a.0	TOTAL PERIOD 2a COST	-	1,192	17	6	-	314	113,764	16,505	131,798	7,555	124,243	-	-	5,629	-	-	-	112,581	26	1,197,496
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	-	-	-	-	-	-	377	94	472	472	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	390	96	487	487	-	-	-	-	-	-	-	-	-	-

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,625	244	1,869	-	1,869	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	1,625	244	1,869	-	1,869	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	913	91	1,004	-	1,004	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	1,500	150	1,650	-	1,650	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	226	-	-	-	-	-	57	283	283	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	3	1	-	62	-	16	83	83	-	-	-	1,118	-	-	-	22,366	5	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	396	59	455	-	455	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	605	61	666	666	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	300	30	330	-	330	-	-	-	-	-	-	-	-	-
2b.4.8	Site O&M Costs	-	-	-	-	-	-	375	56	431	-	431	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	132	20	152	-	152	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	1,489	223	1,713	-	1,713	-	-	-	-	-	-	-	-	30,500
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	2,686	403	3,089	-	3,089	-	-	-	-	-	-	-	-	38,579
2b.4	Subtotal Period 2b Period-Dependent Costs	-	226	3	1	-	62	8,397	1,166	9,856	1,032	8,825	-	-	1,118	-	-	-	22,366	5	69,079
2b.0	TOTAL PERIOD 2b COST	-	226	3	1	-	62	10,412	1,506	12,212	1,518	10,693	-	-	1,118	-	-	-	22,366	5	69,079
PERIOD 2 TOTALS		-	1,418	20	7	-	377	124,176	18,012	144,010	9,074	134,936	-	-	6,747	-	-	-	134,947	31	1,266,575
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	885	133	1,018	1,018	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	590	89	679	679	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	483	73	556	556	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	870	130	1,000	900	-	100	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	492	74	565	509	-	57	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	838	126	964	964	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	767	115	882	882	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	189	28	217	109	-	109	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	368	55	423	212	-	212	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	106	16	122	61	-	61	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	4,694	704	5,398	4,752	-	646	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	283	42	326	326	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	145	22	167	167	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	13,580	2,037	15,617	14,970	-	646	-	-	-	-	-	-	-	72,703

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	304	30	334	334	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	500	50	550	550	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	369	-	-	-	-	-	92	461	461	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	2	1	-	29	-	7	38	38	-	-	-	516	-	-	-	10,311	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	249	25	274	274	-	-	-	-	-	-	-	-	-	-
3a.4.8	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	2,986	448	3,434	3,434	-	-	-	-	-	-	-	-	-	69,350
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	19,481	2,922	22,403	22,403	-	-	-	-	-	-	-	-	-	260,714
3a.4	Subtotal Period 3a Period-Dependent Costs	-	789	2	1	-	29	24,964	3,855	29,639	29,639	-	-	-	516	-	-	-	10,311	2	330,064
3a.0	TOTAL PERIOD 3a COST	-	789	2	1	-	29	38,543	5,892	45,255	44,609	-	646	-	516	-	-	-	10,311	2	402,767
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	559	84	642	578	-	64	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	295	44	339	339	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	159	24	183	46	-	137	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	428	64	493	493	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	142	21	163	81	-	81	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	142	21	163	163	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	118	18	136	68	-	68	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	184	28	212	-	-	212	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	184	28	212	-	-	212	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	322	48	370	333	-	37	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	322	48	370	333	-	37	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,805	571	4,376	3,527	-	848	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,805	571	4,376	3,527	-	848	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	6,341	1,902	8,243	8,243	-	-	-	-	-	-	-	-	30,500	10,852
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	6,341	1,902	8,243	8,243	-	-	-	-	-	-	-	-	30,500	10,852
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	811	1,100	-	-	-	-	1,130	456	3,497	3,497	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	25	-	-	-	-	-	-	6	31	31	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	168	17	185	185	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	251	25	276	276	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	204	-	-	-	-	-	51	255	255	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	211	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	1	0	-	16	-	4	22	22	-	-	-	292	-	-	-	5,846	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	661	99	761	761	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	125	12	137	137	-	-	-	-	-	-	-	-	-	-

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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.4.9	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	1,497	225	1,722	1,722	-	-	-	-	-	-	-	-	-	34,770
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	4,781	717	5,498	5,498	-	-	-	-	-	-	-	-	-	58,560
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	9,767	1,465	11,232	11,232	-	-	-	-	-	-	-	-	-	130,714
3b.4	Subtotal Period 3b Period-Dependent Costs	25	415	1	0	-	16	17,313	2,663	20,433	20,433	-	-	-	292	-	-	-	5,846	1	224,044
3b.0	TOTAL PERIOD 3b COST	836	1,515	1	0	-	16	28,589	5,592	36,548	35,700	-	848	-	292	-	-	-	5,846	30,501	267,139
PERIOD 3 TOTALS		836	2,304	2	1	-	45	67,132	11,483	81,804	80,309	-	1,495	-	808	-	-	-	16,157	30,504	669,906
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	46	160	33	29	-	341	-	156	765	765	-	-	-	1,728	-	-	-	208,992	3,290	-
4a.1.1.2	Pressurizer Relief Tank	8	29	6	6	-	60	-	28	136	136	-	-	-	329	-	-	-	36,553	596	-
4a.1.1.3	Reactor Coolant Pumps & Motors	28	105	57	168	-	1,272	-	389	2,018	2,018	-	-	-	4,796	-	-	-	780,540	2,726	80
4a.1.1.4	Pressurizer	12	68	347	94	-	412	-	175	1,108	1,108	-	-	-	3,033	-	-	-	252,826	1,527	750
4a.1.1.5	Steam Generators	94	4,168	2,158	2,533	667	4,349	-	2,872	16,841	16,841	-	-	45,513	17,359	-	-	-	3,811,289	20,508	1,500
4a.1.1.6	Retired Steam Generator Units	-	-	1,486	2,673	580	3,416	-	1,491	9,646	9,646	-	-	39,289	14,064	-	-	-	3,041,432	10,800	1,500
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	22	80	176	31	-	59	-	68	436	436	-	-	-	2,843	-	-	-	50,181	1,648	-
4a.1.1.8	Reactor Vessel Internals	77	2,017	3,471	566	-	4,811	206	4,997	16,144	16,144	-	-	-	1,710	876	459	-	325,944	23,400	1,068
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	11,837	-	1,776	13,613	13,613	-	-	-	-	-	-	505	104,146	-	-
4a.1.1.10	Reactor Vessel	90	3,987	1,302	670	-	3,071	206	5,094	14,418	14,418	-	-	-	6,672	2,254	-	-	979,179	23,400	1,068
4a.1.1	Totals	376	10,613	9,037	6,769	1,247	29,628	411	17,044	75,124	75,124	-	-	84,802	52,534	3,130	459	505	9,591,082	87,895	5,966
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	574	262	32	214	-	-	207	1,288	1,288	-	-	5,355	-	-	-	-	455,213	9,016	-
4a.1.3	Main Condensers	-	1,176	136	27	150	-	-	334	1,823	1,823	-	-	7,111	-	-	-	-	320,000	18,250	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,171	-	-	-	-	-	176	1,346	1,346	-	-	-	-	-	-	-	-	12,130	-
4a.1.4.2	Auxiliary Building	-	644	-	-	-	-	-	97	741	741	-	-	-	-	-	-	-	-	6,782	-
4a.1.4.3	Refueling Water Storage Tank	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,299	-
4a.1.4.4	Steam Generator Storage Facility	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	507	-
4a.1.4	Totals	-	1,977	-	-	-	-	-	297	2,273	2,273	-	-	-	-	-	-	-	-	20,718	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwater	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,244	-
4a.1.5.2	Auxiliary Steam	-	70	-	-	-	-	-	10	80	-	-	80	-	-	-	-	-	-	1,126	-
4a.1.5.3	Auxiliary Steam RCA	-	134	2	3	16	-	-	36	190	190	-	-	835	-	-	-	-	33,900	1,935	-
4a.1.5.4	Boric Acid Processing	-	492	33	31	86	99	-	169	912	912	-	-	4,531	1,193	-	-	-	268,274	7,890	-
4a.1.5.5	CO2 & H2	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	419	-
4a.1.5.6	CO2 & H2 RCA	-	38	0	1	3	-	-	10	52	52	-	-	164	-	-	-	-	6,658	572	-
4a.1.5.7	Chemical Feed	-	57	-	-	-	-	-	9	66	-	-	66	-	-	-	-	-	-	934	-
4a.1.5.8	Chilled Water	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,142	-
4a.1.5.9	Circulating Water	-	318	-	-	-	-	-	48	365	-	-	365	-	-	-	-	-	-	5,174	-
4a.1.5.10	Condensate	-	377	-	-	-	-	-	56	433	-	-	433	-	-	-	-	-	-	6,023	-
4a.1.5.11	Condensate Booster	-	339	-	-	-	-	-	51	390	-	-	390	-	-	-	-	-	-	5,428	-
4a.1.5.12	Condensate Cleanup	-	66	-	-	-	-	-	10	76	-	-	76	-	-	-	-	-	-	1,060	-
4a.1.5.13	Containment Spray	-	256	7	12	69	-	-	77	421	421	-	-	3,629	-	-	-	-	147,367	3,729	-
4a.1.5.14	Diesel Fuel Oil	-	102	-	-	-	-	-	15	117	-	-	117	-	-	-	-	-	-	1,615	-
4a.1.5.15	Essential Service Water	-	236	-	-	-	-	-	35	271	-	-	271	-	-	-	-	-	-	3,837	-
4a.1.5.16	Extraction Steam	-	189	-	-	-	-	-	28	217	-	-	217	-	-	-	-	-	-	3,089	-
4a.1.5.17	Feedwater	-	316	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	5,142	-
4a.1.5.18	Feedwater Drains	-	758	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	12,366	-
4a.1.5.19	Gland Steam	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	932	-

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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
Disposal of Plant Systems (continued)																					
4a.1.5.20	Gland Water	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	828	-
4a.1.5.21	Main Steam	-	322	-	-	-	-	-	48	371	-	-	371	-	-	-	-	-	-	5,216	-
4a.1.5.22	Main Steam RCA	-	51	1	3	15	-	-	15	85	85	-	-	760	-	-	-	-	30,853	739	-
4a.1.5.23	Nitrogen	-	3	0	0	1	-	-	1	5	5	-	-	52	-	-	-	-	2,102	49	-
4a.1.5.24	Non-Essential Service Water	-	178	-	-	-	-	-	27	204	-	-	204	-	-	-	-	-	-	2,916	-
4a.1.5.25	Non-Essential Service Water RCA	-	93	3	5	28	-	-	29	158	158	-	-	1,462	-	-	-	-	59,354	1,295	-
4a.1.5.26	Off Gas	-	563	10	19	106	-	-	160	858	858	-	-	5,572	-	-	-	-	226,266	8,494	-
4a.1.5.27	Process Radiation Monitoring	-	40	0	0	2	-	-	11	54	54	-	-	113	-	-	-	-	4,587	666	-
4a.1.5.28	Process Sampling	-	119	1	2	12	-	-	32	166	166	-	-	616	-	-	-	-	25,019	1,927	-
4a.1.5.29	Screen Wash	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	821	-
4a.1.5.30	Station Air	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	498	-
4a.1.5.31	Station Heating	-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	1,771	-
4a.1.5.32	Switchgear Heat Removal	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	139	-
4a.1.5.33	Turbine Bldg Equip Drains	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	17	-
4a.1.5.34	Turbine Generator	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	901	-
4a.1.5.35	Turbine Oil	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	1,399	-
4a.1.5.36	Waste Oil Sumps	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	483	-
4a.1.5	Totals	-	5,772	57	76	338	99	-	1,137	7,480	2,900	-	4,580	17,732	1,193	-	-	-	804,381	91,814	-
4a.1.6	Scaffolding in support of decommissioning	-	1,060	6	1	6	2	-	267	1,343	1,343	-	-	306	19	-	-	-	15,459	18,101	-
4a.1	Subtotal Period 4a Activity Costs	376	21,171	9,499	6,904	1,956	29,729	411	19,286	89,332	84,752	-	4,580	115,307	53,747	3,130	459	505	11,186,130	245,794	5,966
Period 4a Collateral Costs																					
4a.3.1	Process liquid waste	75	-	34	152	-	147	-	100	508	508	-	-	-	528	-	-	-	31,673	103	-
4a.3.2	Small tool allowance	-	236	-	-	-	-	-	35	271	244	-	27	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	75	236	34	152	-	147	-	136	779	752	-	27	-	528	-	-	-	31,673	103	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	65	-	-	-	-	-	-	16	82	82	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	445	44	489	489	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	661	66	727	655	-	73	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,505	-	-	-	-	-	376	1,881	1,881	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,348	-	-	-	-	-	352	2,700	2,700	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	9	3	-	173	-	45	230	230	-	-	-	3,103	-	-	-	62,068	14	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,658	249	1,907	1,907	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	871	87	958	958	-	-	-	-	-	-	-	-	-	-
4a.4.9	Site O&M Costs	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	507	76	583	583	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	2,628	394	3,022	3,022	-	-	-	-	-	-	-	-	-	61,244
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	15,016	2,252	17,268	17,268	-	-	-	-	-	-	-	-	-	188,508
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	24,422	3,663	28,086	28,086	-	-	-	-	-	-	-	-	-	332,359
4a.4	Subtotal Period 4a Period-Dependent Costs	65	3,853	9	3	-	173	46,373	7,647	58,124	58,051	-	73	-	3,103	-	-	-	62,068	14	582,112
4a.0	TOTAL PERIOD 4a COST	516	25,259	9,542	7,060	1,956	30,049	46,785	27,068	148,235	143,555	-	4,680	115,307	57,378	3,130	459	505	11,279,880	245,911	588,078
PERIOD 4b - Site Decontamination																					
Disposal of Plant Systems																					
4b.1.2.1	Chemical & Volume Control	-	1,095	64	47	33	255	-	356	1,851	1,851	-	-	1,744	2,431	-	-	-	287,102	16,313	-
4b.1.2.2	Chilled Water RCA	-	311	9	16	90	-	-	95	520	520	-	-	4,716	-	-	-	-	191,536	4,732	-
4b.1.2.3	Component Cooling RCA	-	661	16	29	164	-	-	196	1,066	1,066	-	-	8,589	-	-	-	-	348,801	9,675	-
4b.1.2.4	Electrical	-	3,047	-	-	-	-	-	457	3,504	-	-	3,504	-	-	-	-	-	-	48,490	-
4b.1.2.5	Electrical - Contaminated	-	1,128	12	23	128	-	-	306	1,597	1,597	-	-	6,722	-	-	-	-	272,965	17,115	-
4b.1.2.6	Electrical - RCA	-	1,881	32	59	335	-	-	532	2,839	2,839	-	-	17,555	-	-	-	-	712,922	29,098	-
4b.1.2.7	Emergency Diesel Generator	-	129	-	-	-	-	-	19	148	-	-	148	-	-	-	-	-	-	2,066	-
4b.1.2.8	Essential Service Water RCA	-	297	10	17	99	-	-	93	515	515	-	-	5,177	-	-	-	-	210,230	4,418	-
4b.1.2.9	Fire Protection	-	122	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	1,984	-

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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
Disposal of Plant Systems (continued)																					
4b.1.2.10	Fire Protection RCA	-	180	2	3	20	-	-	49	254	254	-	-	1,037	-	-	-	-	42,116	2,577	-
4b.1.2.11	HVAC-Auxiliary Building	-	486	9	17	96	-	-	139	747	747	-	-	5,054	-	-	-	-	205,243	7,162	-
4b.1.2.12	HVAC-Diesel Generator Room	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	682	-
4b.1.2.13	HVAC-Miscellaneous	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	656	-
4b.1.2.14	HVAC-Primary Containment	-	588	19	36	204	-	-	185	1,032	1,032	-	-	10,679	-	-	-	-	433,695	8,624	-
4b.1.2.15	HVAC-Turbine Building	-	187	-	-	-	-	-	28	215	-	-	215	-	-	-	-	-	-	3,177	-
4b.1.2.16	Instrument Air Supply	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	760	-
4b.1.2.17	Instrument Air Supply RCA	-	73	1	1	7	-	-	20	102	102	-	-	366	-	-	-	-	14,869	1,073	-
4b.1.2.18	Miscellaneous Drains	-	38	1	1	6	-	-	11	57	57	-	-	312	-	-	-	-	12,666	584	-
4b.1.2.19	Primary Containment Purge	-	274	10	20	112	-	-	89	504	504	-	-	5,850	-	-	-	-	237,590	4,312	-
4b.1.2.20	Primary Water	-	59	1	1	3	4	-	17	86	86	-	-	143	42	-	-	-	9,560	915	-
4b.1.2.21	Radioactive Waste Disposal	-	899	46	39	81	154	-	286	1,504	1,504	-	-	4,235	1,622	-	-	-	302,491	14,169	-
4b.1.2.22	Reactor Building Equipment Drains	-	97	7	5	3	29	-	33	175	175	-	-	183	277	-	-	-	32,048	1,435	-
4b.1.2.23	Reactor Building Floor Drains	-	45	2	2	2	8	-	14	73	73	-	-	130	74	-	-	-	11,914	678	-
4b.1.2.24	Reactor Coolant	-	169	9	6	4	34	-	53	276	276	-	-	208	324	-	-	-	37,451	2,506	-
4b.1.2.25	Residual Heat Removal	-	190	11	12	28	44	-	66	351	351	-	-	1,453	418	-	-	-	96,526	2,924	-
4b.1.2.26	Safety Injection	-	865	38	48	175	103	-	279	1,509	1,509	-	-	9,181	1,028	-	-	-	460,142	13,528	-
4b.1.2.27	Station Air RCA	-	36	0	1	3	-	-	9	49	49	-	-	175	-	-	-	-	7,089	521	-
4b.1.2.28	Station Heating RCA	-	120	2	4	24	-	-	34	184	184	-	-	1,256	-	-	-	-	51,005	1,759	-
4b.1.2.29	Waste Oil Sumps RCA	-	7	0	0	1	-	-	2	10	10	-	-	52	-	-	-	-	2,098	92	-
4b.1.2	Totals	-	13,115	301	388	1,619	632	-	3,406	19,461	15,302	-	4,159	84,817	6,216	-	-	-	3,980,059	202,024	-
4b.1.3	Scaffolding in support of decommissioning	-	1,589	9	2	10	3	-	401	2,014	2,014	-	-	458	29	-	-	-	23,188	27,151	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,937	1,369	182	196	134	604	-	1,529	5,951	5,951	-	-	7,022	8,897	-	-	-	1,144,512	50,361	-
4b.1.4.2	Auxiliary Building	194	103	6	7	17	13	-	130	470	470	-	-	866	229	-	-	-	57,065	4,554	-
4b.1.4.3	Refueling Water Storage Tank	352	408	4	5	22	6	-	284	1,081	1,081	-	-	1,146	87	-	-	-	54,852	11,906	-
4b.1.4.4	Steam Generator Storage Facility	57	0	0	0	0	0	-	29	86	86	-	-	1	0	-	-	-	40	888	-
4b.1.4	Totals	2,540	1,880	192	208	172	623	-	1,972	7,588	7,588	-	-	9,034	9,212	-	-	-	1,256,470	67,709	-
4b.1	Subtotal Period 4b Activity Costs	2,540	16,585	502	598	1,801	1,258	-	5,779	29,063	24,904	-	4,159	94,309	15,457	-	-	-	5,259,717	296,885	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	ISFSI License Termination	-	36	0	24	-	89	618	127	894	-	894	-	-	1,688	-	-	-	142,260	1,473	1,280
4b.2	Subtotal Period 4b Additional Costs	-	36	0	24	-	89	1,558	410	2,116	1,222	894	-	-	1,688	-	-	-	142,260	1,473	7,520
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	90	-	41	185	-	179	-	122	617	617	-	-	-	641	-	-	-	38,474	125	-
4b.3.2	Small tool allowance	-	306	-	-	-	-	-	46	352	352	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	123	34	127	40	-	46	369	369	-	-	6,000	373	-	-	-	303,507	88	-
4b.3	Subtotal Period 4b Collateral Costs	90	306	164	219	127	218	-	214	1,337	1,337	-	-	6,000	1,015	-	-	-	341,981	213	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	686	-	-	-	-	-	-	171	857	857	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	745	74	819	819	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	1,107	111	1,218	1,218	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,992	-	-	-	-	-	498	2,490	2,490	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	3,900	-	-	-	-	-	585	4,486	4,486	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	13	5	-	241	-	62	321	321	-	-	-	4,321	-	-	-	86,419	20	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,193	329	2,522	2,522	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,459	146	1,605	1,605	-	-	-	-	-	-	-	-	-	-
4b.4.9	Site O&M Costs	-	-	-	-	-	-	277	42	318	318	-	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	849	127	976	976	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	967	145	1,112	1,112	-	-	-	-	-	-	-	-	-	25,426
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	16,431	2,465	18,895	18,895	-	-	-	-	-	-	-	-	-	217,274
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	27,621	4,143	31,764	31,764	-	-	-	-	-	-	-	-	-	388,320

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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
4b.4	Subtotal Period 4b Period-Dependent Costs	686	5,893	13	5	-	241	51,648	8,898	67,384	67,384	-	-	-	4,321	-	-	-	86,419	20	631,020
4b.0	TOTAL PERIOD 4b COST	3,316	22,820	679	845	1,928	1,806	53,206	15,301	99,900	94,847	894	4,159	100,309	22,480	-	-	-	5,830,376	298,591	638,540
PERIOD 4d - Delay before License Termination																					
Period 4d Period-Dependent Costs																					
4d.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4d.4.2	Property taxes	-	-	-	-	-	-	668	67	735	735	-	-	-	-	-	-	-	-	-	-
4d.4.3	Health physics supplies	-	102	-	-	-	-	-	25	127	127	-	-	-	-	-	-	-	-	-	-
4d.4.4	Disposal of DAW generated	-	-	0	0	-	7	-	2	10	10	-	-	-	133	-	-	-	2,665	1	-
4d.4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4d.4.6	NRC Fees	-	-	-	-	-	-	244	24	268	268	-	-	-	-	-	-	-	-	-	-
4d.4.7	Site O&M Costs	-	-	-	-	-	-	167	25	192	192	-	-	-	-	-	-	-	-	-	-
4d.4.8	Utility Staff Cost	-	-	-	-	-	-	1,374	206	1,580	1,580	-	-	-	-	-	-	-	-	-	19,520
4d.4	Subtotal Period 4d Period-Dependent Costs	-	102	0	0	-	7	2,453	350	2,912	2,912	-	-	-	133	-	-	-	2,665	1	19,520
4d.0	TOTAL PERIOD 4d COST	-	102	0	0	-	7	2,453	350	2,912	2,912	-	-	-	133	-	-	-	2,665	1	19,520
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	-	-	-	-	-	-	6,204	1,861	8,065	8,065	-	-	-	-	-	-	-	-	97,350	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	6,204	1,861	8,065	8,065	-	-	-	-	-	-	-	-	97,350	3,120
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	628	-	-	-	-	-	157	785	785	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	19	-	5	25	25	-	-	-	335	-	-	-	6,698	2	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	532	53	585	585	-	-	-	-	-	-	-	-	-	-
4e.4.7	Site O&M Costs	-	-	-	-	-	-	94	14	108	108	-	-	-	-	-	-	-	-	-	-
4e.4.8	Security Staff Cost	-	-	-	-	-	-	527	79	606	606	-	-	-	-	-	-	-	-	-	11,786
4e.4.9	DOC Staff Cost	-	-	-	-	-	-	3,801	570	4,371	4,371	-	-	-	-	-	-	-	-	-	46,750
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	4,551	683	5,234	5,234	-	-	-	-	-	-	-	-	-	56,964
4e.4	Subtotal Period 4e Period-Dependent Costs	-	628	1	0	-	19	10,079	1,628	12,356	12,356	-	-	-	335	-	-	-	6,698	2	115,500
4e.0	TOTAL PERIOD 4e COST	-	628	1	0	-	19	17,564	3,704	21,917	21,917	-	-	-	335	-	-	-	6,698	97,352	118,620
PERIOD 4 TOTALS		3,832	48,808	10,222	7,906	3,884	31,881	120,008	46,423	272,963	263,230	894	8,839	215,616	80,326	3,130	459	505	17,119,610	641,854	1,364,758
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	6,763	-	-	-	-	-	1,014	7,778	-	-	7,778	-	-	-	-	-	-	69,546	-
5b.1.1.2	Auxiliary Building	-	5,798	-	-	-	-	-	870	6,667	-	-	6,667	-	-	-	-	-	-	61,037	-
5b.1.1.3	Refueling Water Storage Tank	-	1,028	-	-	-	-	-	154	1,182	-	-	1,182	-	-	-	-	-	-	11,692	-

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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
Demolition of Remaining Site Buildings (continued)																					
5b.1.1.4	Steam Generator Storage Facility	-	429	-	-	-	-	-	64	493	-	-	493	-	-	-	-	-	-	4,559	-
5b.1.1.5	Turbine Building	-	5,769	-	-	-	-	-	865	6,634	-	-	6,634	-	-	-	-	-	-	70,342	-
5b.1.1.6	Turbine Pedestal	-	1,352	-	-	-	-	-	203	1,555	-	-	1,555	-	-	-	-	-	-	12,628	-
5b.1.1	Totals	-	21,138	-	-	-	-	-	3,171	24,309	-	-	24,309	-	-	-	-	-	-	229,805	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	716	-	-	-	-	-	107	823	-	-	823	-	-	-	-	-	-	1,942	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	184	28	212	212	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	21,854	-	-	-	-	184	3,306	25,343	212	-	25,132	-	-	-	-	-	-	231,747	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	603	-	-	-	-	3	91	697	-	-	697	-	-	-	-	-	-	2,798	-
5b.2.2	ISFSI Demolition and Site Restoration	-	516	-	-	-	-	24	81	622	-	622	-	-	-	-	-	-	-	5,235	80
5b.2	Subtotal Period 5b Additional Costs	-	1,120	-	-	-	-	27	172	1,319	-	622	697	-	-	-	-	-	-	8,033	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	262	-	-	-	-	-	39	301	-	-	301	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	262	-	-	-	-	-	39	301	-	-	301	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,239	124	1,363	-	-	1,363	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,239	-	-	-	-	-	936	7,174	-	-	7,174	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	327	49	376	-	-	376	-	-	-	-	-	-	-	-
5b.4.5	Site O&M Cost	-	-	-	-	-	-	310	46	356	-	-	356	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	1,561	234	1,795	-	-	1,795	-	-	-	-	-	-	-	34,287
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	11,650	1,748	13,398	-	-	13,398	-	-	-	-	-	-	-	137,043
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,559	834	6,392	-	-	6,392	-	-	-	-	-	-	-	67,229
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,239	-	-	-	-	20,645	3,971	30,855	-	-	30,855	-	-	-	-	-	-	-	238,558
5b.0	TOTAL PERIOD 5b COST	-	29,474	-	-	-	-	20,857	7,488	57,818	212	622	56,985	-	-	-	-	-	-	239,780	240,198
PERIOD 5 TOTALS		-	29,474	-	-	-	-	20,857	7,488	57,818	212	622	56,985	-	-	-	-	-	-	239,780	240,198
TOTAL COST TO DECOMMISSION		9,156	84,022	10,395	8,575	3,884	33,008	386,394	93,904	629,338	424,316	137,704	67,318	215,616	91,399	3,130	459	505	17,432,430	972,325	4,132,638

Table D-1
Braidwood Nuclear Power Station, Unit 1
Delayed 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

TOTAL COST TO DECOMMISSION WITH 17.54% CONTINGENCY:	$629,338	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 67.42% OR:	$424,316	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 21.88% OR:	$137,704	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 10.7% OR:	$67,318	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	94,988	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	57,871	tons
TOTAL CRAFT LABOR REQUIREMENTS:	972,325	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
Braidwood Nuclear Power Station, Unit 2
Delayed 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 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	398	119	517	517	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	76	11	87	87	-	-	-	-	-	-	-	-	-	642
1a.1.13	Define major work sequence	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	253	38	290	290	-	-	-	-	-	-	-	-	-	2,140
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	249	37	286	286	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	210	32	242	242	-	-	-	-	-	-	-	-	-	1,783
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	158	24	181	181	-	-	-	-	-	-	-	-	-	1,335
1a.1.16.4	Waste management	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	819	123	941	941	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	2,211	391	2,602	2,602	-	-	-	-	-	-	-	-	-	15,361
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	751	75	826	826	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	421	-	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	471	47	518	518	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	315	32	347	-	347	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	381	57	438	-	438	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	6,337	950	7,287	7,287	-	-	-	-	-	-	-	-	-	157,471
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	31,082	4,662	35,745	35,745	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	842	2	1	-	34	40,825	6,224	47,927	47,092	836	-	-	610	-	-	-	12,190	3	580,871
1a.0	TOTAL PERIOD 1a COST	-	842	2	1	-	34	43,035	6,615	50,529	49,693	836	-	-	610	-	-	-	12,190	3	596,232

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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 - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	2,135	-	-	-	-	-	-	1,067	3,202	3,202	-	-	-	-	-	-	-	-	33,093	-
1b.1.1.2	Auxiliary Building	246	-	-	-	-	-	-	123	369	369	-	-	-	-	-	-	-	-	3,829	-
1b.1.1.3	Radwaste/Service Building	160	-	-	-	-	-	-	80	240	240	-	-	-	-	-	-	-	-	2,506	-
1b.1.1.4	Refueling Water Storage Tank	351	-	-	-	-	-	-	176	527	527	-	-	-	-	-	-	-	-	5,322	-
1b.1.1.5	Fuel Handling Building	1,003	-	-	-	-	-	-	502	1,505	1,505	-	-	-	-	-	-	-	-	15,238	-
1b.1.1	Totals	3,895	-	-	-	-	-	-	1,947	5,842	5,842	-	-	-	-	-	-	-	-	59,989	-
1b.1	Subtotal Period 1b Activity Costs	3,895	-	-	-	-	-	-	1,947	5,842	5,842	-	-	-	-	-	-	-	-	59,989	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	205	-	90	404	-	389	-	269	1,357	1,357	-	-	-	1,398	-	-	-	83,852	272	-
1b.3.3	Small tool allowance	-	64	-	-	-	-	-	10	73	73	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,016	64	90	404	-	389	-	401	2,363	2,363	-	-	-	1,398	-	-	-	83,852	272	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	746	-	-	-	-	-	-	187	933	933	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	340	-	-	-	-	-	85	425	425	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	2	1	-	33	-	8	43	43	-	-	-	585	-	-	-	11,699	3	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	117	12	129	129	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,580	237	1,817	1,817	-	-	-	-	-	-	-	-	-	39,260
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,749	1,162	8,912	8,912	-	-	-	-	-	-	-	-	-	105,560
1b.4	Subtotal Period 1b Period-Dependent Costs	746	445	2	1	-	33	11,790	1,965	14,982	14,773	208	-	-	585	-	-	-	11,699	3	144,820
1b.0	TOTAL PERIOD 1b COST	5,657	509	92	404	-	422	11,790	4,313	23,186	22,978	208	-	-	1,983	-	-	-	95,552	60,264	144,820
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	457	-	-	-	-	-	69	525	525	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	13,416	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	29	4	34	34	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	504	-	-	-	-	762	300	1,567	1,567	-	-	-	-	-	-	-	-	17,116	250
Period 1c Additional Costs																					
1c.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
1c.2	Subtotal Period 1c Additional Costs	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	251	-	110	494	-	476	-	330	1,661	1,661	-	-	-	1,710	-	-	-	102,618	333	-
1c.3.2	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	251	4	110	494	-	476	-	330	1,666	1,666	-	-	-	1,710	-	-	-	102,618	333	-

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	144	-	-	-	-	-	36	179	179	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	6	-	1	7	7	-	-	-	99	-	-	-	1,976	0	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	117	12	129	129	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1c.4.9	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,580	237	1,817	1,817	-	-	-	-	-	-	-	-	-	39,260
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	1,073	161	1,234	1,234	-	-	-	-	-	-	-	-	-	13,520
1c.4	Subtotal Period 1c Period-Dependent Costs	-	248	0	0	-	6	5,114	720	6,089	5,881	208	-	-	99	-	-	-	1,976	0	52,780
1c.0	TOTAL PERIOD 1c COST	251	757	110	494	-	482	15,566	2,804	20,465	20,257	208	-	-	1,809	-	-	-	104,595	17,450	53,030
PERIOD 1 TOTALS		5,908	2,108	204	899	-	937	70,392	13,732	94,180	92,928	1,252	-	-	4,401	-	-	-	212,337	77,716	794,082
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	-	-	-	-	-	-	931	140	1,071	1,071	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	1,944	486	2,430	2,430	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	2,876	626	3,501	3,501	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	11,500	1,725	13,225	-	13,225	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	11,500	1,725	13,225	-	13,225	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	5,197	520	5,717	5,007	710	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	13,459	1,346	14,805	8,502	6,303	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	1,271	-	-	-	-	-	318	1,589	1,589	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	18	7	-	332	-	86	442	442	-	-	-	5,950	-	-	-	118,994	27	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	4,081	612	4,693	2,346	2,346	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	2,765	276	3,041	3,041	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,546	155	1,700	-	1,700	-	-	-	-	-	-	-	-	-
2a.4.8	Site O&M Costs	-	-	-	-	-	-	1,932	290	2,222	2,222	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	6,826	1,024	7,850	-	7,850	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	680	102	782	-	782	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	39,751	5,963	45,714	-	45,714	-	-	-	-	-	-	-	-	965,627
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	40,979	6,147	47,125	9,694	37,432	-	-	-	-	-	-	-	-	525,885
2a.4	Subtotal Period 2a Period-Dependent Costs	-	1,271	18	7	-	332	117,215	16,838	135,680	32,844	102,836	-	-	5,950	-	-	-	118,994	27	1,491,512
2a.0	TOTAL PERIOD 2a COST	-	1,271	18	7	-	332	131,591	19,188	152,406	36,345	116,061	-	-	5,950	-	-	-	118,994	27	1,491,512
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	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	136	34	170	170	-	-	-	-	-	-	-	-	-	-

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	201	44	245	245	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,625	244	1,869	-	1,869	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	1,625	244	1,869	-	1,869	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	329	33	362	350	11	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	541	54	595	595	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	84	-	-	-	-	-	21	105	105	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	1	0	-	23	-	6	30	30	-	-	-	408	-	-	-	8,161	2	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	143	21	164	164	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	193	19	213	213	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	108	11	119	-	119	-	-	-	-	-	-	-	-	-
2b.4.8	Site O&M Costs	-	-	-	-	-	-	135	20	155	155	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	48	7	55	-	55	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	486	73	558	-	558	-	-	-	-	-	-	-	-	10,992
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	1,640	246	1,886	678	1,207	-	-	-	-	-	-	-	-	22,571
2b.4	Subtotal Period 2b Period-Dependent Costs	-	84	1	0	-	23	3,622	512	4,242	2,291	1,951	-	-	408	-	-	-	8,161	2	33,564
2b.0	TOTAL PERIOD 2b COST	-	84	1	0	-	23	5,448	799	6,356	2,536	3,820	-	-	408	-	-	-	8,161	2	33,564
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	-	-	-	-	-	-	52	8	59	59	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	108	27	135	135	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	159	35	194	194	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	252	25	278	278	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	428	43	471	471	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	63	-	-	-	-	-	16	79	79	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	1	0	-	18	-	5	24	24	-	-	-	317	-	-	-	6,343	1	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	113	17	130	130	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	146	15	161	161	-	-	-	-	-	-	-	-	-	-
2c.4.7	Site O&M Costs	-	-	-	-	-	-	107	16	123	123	-	-	-	-	-	-	-	-	-	-
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	467	70	537	537	-	-	-	-	-	-	-	-	-	7,154
2c.4	Subtotal Period 2c Period-Dependent Costs	-	63	1	0	-	18	1,515	206	1,803	1,803	-	-	-	317	-	-	-	6,343	1	7,154
2c.0	TOTAL PERIOD 2c COST	-	63	1	0	-	18	1,674	241	1,997	1,997	-	-	-	317	-	-	-	6,343	1	7,154
PERIOD 2 TOTALS		-	1,419	20	7	-	372	138,713	20,228	160,760	40,879	119,881	-	-	6,675	-	-	-	133,497	31	1,532,230
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	379	57	436	436	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,327
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	253	38	290	290	-	-	-	-	-	-	-	-	-	2,140
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	207	31	238	238	-	-	-	-	-	-	-	-	-	1,753

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	372	56	428	385	-	43	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	210	32	242	218	-	24	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	359	54	412	412	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	328	49	378	378	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	158	24	181	181	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	81	12	93	46	-	46	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	158	24	181	91	-	91	-	-	-	-	-	-	-	1,335
3a.1.11.11	Waste management	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	2,009	301	2,310	2,034	-	277	-	-	-	-	-	-	-	17,024
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	121	18	139	139	-	-	-	-	-	-	-	-	-	1,027
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	8,672	1,301	9,973	9,696	-	277	-	-	-	-	-	-	-	31,117
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	304	30	334	334	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	500	50	550	550	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	349	-	-	-	-	-	87	437	437	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	1	1	-	27	-	7	36	36	-	-	-	481	-	-	-	9,613	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
3a.4.8	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	238	36	274	274	-	-	-	-	-	-	-	-	-	6,257
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	14,259	2,139	16,398	16,398	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	770	1	1	-	27	16,959	2,650	20,408	20,408	-	-	-	481	-	-	-	9,613	2	206,486
3a.0	TOTAL PERIOD 3a COST	-	770	1	1	-	27	25,631	3,951	30,381	30,105	-	277	-	481	-	-	-	9,613	2	237,603
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	239	36	275	247	-	27	-	-	-	-	-	-	-	2,026
3b.1.1.2	Reactor internals	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	1,070
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	68	10	78	20	-	59	-	-	-	-	-	-	-	578
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	183	28	211	211	-	-	-	-	-	-	-	-	-	1,554
3b.1.1.8	Facility closeout	-	-	-	-	-	-	61	9	70	35	-	35	-	-	-	-	-	-	-	514
3b.1.1.9	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	193
3b.1.1.10	Biological shield	-	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-	-	-	-	514
3b.1.1.11	Steam generators	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	51	8	58	29	-	29	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	79	12	91	-	-	91	-	-	-	-	-	-	-	668

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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
Detailed Work Procedures (continued)																					
3b.1.1.14	Main Condensers	-	-	-	-	-	-	79	12	91	-	-	91	-	-	-	-	-	-	-	668
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	138	21	159	143	-	16	-	-	-	-	-	-	-	1,168
3b.1.1.16	Reactor building	-	-	-	-	-	-	138	21	159	143	-	16	-	-	-	-	-	-	-	1,168
3b.1.1	Total	-	-	-	-	-	-	1,629	244	1,873	1,510	-	363	-	-	-	-	-	-	-	13,800
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,629	244	1,873	1,510	-	363	-	-	-	-	-	-	-	13,800
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	2,657	797	3,454	3,454	-	-	-	-	-	-	-	-	12,779	4,547
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	2,657	797	3,454	3,454	-	-	-	-	-	-	-	-	12,779	4,547
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	811	1,100	-	-	-	-	1,130	456	3,497	3,497	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	25	-	-	-	-	-	-	6	31	31	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	168	17	185	185	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	251	25	276	276	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	189	-	-	-	-	-	47	236	236	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	211	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	1	0	-	15	-	4	20	20	-	-	-	266	-	-	-	5,315	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	661	99	761	761	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	107	11	118	118	-	-	-	-	-	-	-	-	-	-
3b.4.9	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	119	18	137	137	-	-	-	-	-	-	-	-	-	3,137
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	3,296	494	3,790	3,790	-	-	-	-	-	-	-	-	-	42,874
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	7,149	1,072	8,222	8,222	-	-	-	-	-	-	-	-	-	100,389
3b.4	Subtotal Period 3b Period-Dependent Costs	25	400	1	0	-	15	11,815	1,835	14,090	14,090	-	-	-	266	-	-	-	5,315	1	146,400
3b.0	TOTAL PERIOD 3b COST	836	1,500	1	0	-	15	17,230	3,332	22,913	22,550	-	363	-	266	-	-	-	5,315	12,780	164,747
PERIOD 3 TOTALS		836	2,270	2	1	-	42	42,861	7,283	53,295	52,655	-	640	-	746	-	-	-	14,927	12,782	402,349
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	46	160	33	29	-	341	-	156	765	765	-	-	-	1,728	-	-	-	208,992	3,290	-
4a.1.1.2	Pressurizer Relief Tank	8	29	6	6	-	60	-	28	136	136	-	-	-	329	-	-	-	36,553	596	-
4a.1.1.3	Reactor Coolant Pumps & Motors	28	105	57	168	-	1,272	-	389	2,018	2,018	-	-	-	4,796	-	-	-	780,540	2,726	80
4a.1.1.4	Pressurizer	12	68	347	94	-	412	-	175	1,108	1,108	-	-	-	3,033	-	-	-	252,826	1,527	750
4a.1.1.5	Steam Generators	94	4,168	1,486	2,392	580	3,416	-	2,537	14,674	14,674	-	-	39,289	14,436	-	-	-	3,096,232	20,508	1,500
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	22	80	176	31	-	59	-	68	436	436	-	-	-	2,843	-	-	-	50,181	1,648	-
4a.1.1.7	Reactor Vessel Internals	77	2,017	3,471	566	-	4,827	206	5,005	16,170	16,170	-	-	-	1,710	876	459	-	325,944	23,400	1,068
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	11,837	-	1,776	13,613	13,613	-	-	-	-	-	-	505	104,146	-	-
4a.1.1.9	Reactor Vessel	90	3,987	1,302	670	-	3,077	206	5,097	14,427	14,427	-	-	-	6,672	2,254	-	-	979,179	23,400	1,068
4a.1.1	Totals	376	10,613	6,879	3,955	580	25,302	411	15,230	63,346	63,346	-	-	39,289	35,547	3,130	459	505	5,834,593	77,095	4,466
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	574	262	32	214	-	-	207	1,288	1,288	-	-	5,355	-	-	-	-	455,213	9,016	-
4a.1.3	Main Condensers	-	1,176	136	27	150	-	-	334	1,823	1,823	-	-	7,111	-	-	-	-	320,000	18,250	-

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,171	-	-	-	-	-	176	1,346	1,346	-	-	-	-	-	-	-	-	12,130	-
4a.1.4.2	Auxiliary Building	-	655	-	-	-	-	-	98	754	754	-	-	-	-	-	-	-	-	6,896	-
4a.1.4.3	Radwaste/Service Building	-	429	-	-	-	-	-	64	494	494	-	-	-	-	-	-	-	-	5,059	-
4a.1.4.4	Refueling Water Storage Tank	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,299	-
4a.1.4.5	Fuel Handling Building	-	337	-	-	-	-	-	51	388	388	-	-	-	-	-	-	-	-	3,690	-
4a.1.4	Totals	-	2,707	-	-	-	-	-	406	3,113	3,113	-	-	-	-	-	-	-	-	29,074	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwater	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,143	-
4a.1.5.2	Auxiliary Steam	-	130	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,107	-
4a.1.5.3	Auxiliary Steam RCA	-	357	5	9	54	-	-	99	525	525	-	-	2,822	-	-	-	-	114,583	5,241	-
4a.1.5.4	Boric Acid Processing	-	463	28	23	34	106	-	154	808	808	-	-	1,794	1,076	-	-	-	162,827	6,970	-
4a.1.5.5	CO2 & H2	-	18	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	289	-
4a.1.5.6	CO2 & H2 RCA	-	34	1	1	5	-	-	9	50	50	-	-	287	-	-	-	-	11,664	478	-
4a.1.5.7	Chemical Feed	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	2,663	-
4a.1.5.8	Chemical Feed at Intake	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	364	-
4a.1.5.9	Chilled Water	-	91	-	-	-	-	-	14	104	-	-	104	-	-	-	-	-	-	1,454	-
4a.1.5.10	Circulating Water	-	542	-	-	-	-	-	81	624	-	-	624	-	-	-	-	-	-	8,814	-
4a.1.5.11	Condensate	-	333	-	-	-	-	-	50	383	-	-	383	-	-	-	-	-	-	5,317	-
4a.1.5.12	Condensate Booster	-	332	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	5,314	-
4a.1.5.13	Condensate Cleanup	-	182	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	3,000	-
4a.1.5.14	Containment Spray	-	251	7	12	69	-	-	76	414	414	-	-	3,602	-	-	-	-	146,289	3,673	-
4a.1.5.15	Diesel Fuel Oil	-	180	-	-	-	-	-	27	207	-	-	207	-	-	-	-	-	-	2,848	-
4a.1.5.16	Essential Service Water	-	311	-	-	-	-	-	47	358	-	-	358	-	-	-	-	-	-	5,049	-
4a.1.5.17	Extraction Steam	-	223	-	-	-	-	-	33	256	-	-	256	-	-	-	-	-	-	3,637	-
4a.1.5.18	Feedwater	-	303	-	-	-	-	-	45	348	-	-	348	-	-	-	-	-	-	4,925	-
4a.1.5.19	Feedwater Drains	-	719	-	-	-	-	-	108	827	-	-	827	-	-	-	-	-	-	11,719	-
4a.1.5.20	Gland Steam	-	38	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	616	-
4a.1.5.21	Gland Water	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	458	-
4a.1.5.22	Main Steam	-	308	-	-	-	-	-	46	354	-	-	354	-	-	-	-	-	-	4,979	-
4a.1.5.23	Main Steam RCA	-	84	2	3	19	-	-	24	132	132	-	-	990	-	-	-	-	40,190	1,250	-
4a.1.5.24	Make-up Demineralizer	-	155	-	-	-	-	-	23	179	-	-	179	-	-	-	-	-	-	2,595	-
4a.1.5.25	Nitrogen	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	18	-
4a.1.5.26	Non-Essential Service Water	-	361	-	-	-	-	-	54	416	-	-	416	-	-	-	-	-	-	5,903	-
4a.1.5.27	Non-Essential Service Water RCA	-	179	7	13	75	-	-	59	332	332	-	-	3,909	-	-	-	-	158,755	2,535	-
4a.1.5.28	Off Gas	-	665	13	25	141	-	-	192	1,037	1,037	-	-	7,411	-	-	-	-	300,945	10,038	-
4a.1.5.29	Potable Water	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	75	-
4a.1.5.30	Process Radiation Monitoring	-	64	0	0	3	-	-	17	84	84	-	-	138	-	-	-	-	5,613	1,086	-
4a.1.5.31	Process Sampling	-	143	1	2	12	-	-	38	196	196	-	-	641	-	-	-	-	26,045	2,347	-
4a.1.5.32	Screen Wash	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	740	-
4a.1.5.33	Station Air	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	705	-
4a.1.5.34	Station Heating	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	2,391	-
4a.1.5.35	Steam Humidification	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	115	-
4a.1.5.36	Switchgear Heat Removal	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	519	-
4a.1.5.37	Turbine Bldg Equip Drains	-	76	-	-	-	-	-	11	88	-	-	88	-	-	-	-	-	-	1,235	-
4a.1.5.38	Turbine Bldg Floor Drains	-	131	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,117	-
4a.1.5.39	Turbine Oil	-	83	-	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	1,359	-
4a.1.5.40	Turbine-Generator Auxilaries	-	56	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	884	-
4a.1.5.41	Waste Oil Sumps	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	517	-
4a.1.5.42	Well Water	-	79	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,247	-
4a.1.5	Totals	-	7,489	64	90	412	106	-	1,455	9,616	3,579	-	6,037	21,594	1,076	-	-	-	966,911	118,732	-
4a.1.6	Scaffolding in support of decommissioning	-	1,560	10	2	10	3	-	394	1,979	1,979	-	-	473	29	-	-	-	23,936	26,661	-
4a.1	Subtotal Period 4a Activity Costs	376	24,118	7,351	4,106	1,367	25,411	411	18,026	81,165	75,128	-	6,037	73,823	36,653	3,130	459	505	7,600,654	278,829	4,466

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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 4a Collateral Costs																					
4a.3.1	Process liquid waste	76	-	35	156	-	151	-	103	521	521	-	-	-	541	-	-	-	32,439	105	-
4a.3.2	Small tool allowance	-	281	-	-	-	-	-	42	323	291	-	32	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	76	281	35	156	-	151	-	145	843	811	-	32	-	541	-	-	-	32,439	105	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	65	-	-	-	-	-	-	16	81	81	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	442	44	486	486	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	657	66	723	651	-	72	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,630	-	-	-	-	-	408	2,038	2,038	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,333	-	-	-	-	-	350	2,683	2,683	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	9	3	-	176	-	45	234	234	-	-	-	3,149	-	-	-	62,985	14	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,648	247	1,895	1,895	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	593	59	652	652	-	-	-	-	-	-	-	-	-	-
4a.4.9	Site O&M Costs	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	504	76	579	579	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	2,604	391	2,995	2,995	-	-	-	-	-	-	-	-	-	60,699
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,921	2,238	17,159	17,159	-	-	-	-	-	-	-	-	-	187,310
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	24,263	3,639	27,902	27,902	-	-	-	-	-	-	-	-	-	330,240
4a.4	Subtotal Period 4a Period-Dependent Costs	65	3,964	9	3	-	176	45,796	7,604	57,617	57,545	-	72	-	3,149	-	-	-	62,985	14	578,249
4a.0	TOTAL PERIOD 4a COST	518	28,362	7,395	4,265	1,367	25,737	46,207	25,775	139,626	133,484	-	6,142	73,823	40,343	3,130	459	505	7,696,078	278,949	582,715
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	1,093	118	313	95	-	590	-	769	2,978	2,978	-	-	-	5,572	-	-	-	499,920	2,174	-
Disposal of Plant Systems																					
4b.1.2.1	Chemical & Volume Control	-	1,046	60	45	34	243	-	340	1,769	1,769	-	-	1,783	2,322	-	-	-	278,742	15,645	-
4b.1.2.2	Chilled Water RCA	-	647	13	25	139	-	-	188	1,012	1,012	-	-	7,293	-	-	-	-	296,176	9,173	-
4b.1.2.3	Component Cooling	-	687	17	31	178	-	-	205	1,118	1,118	-	-	9,319	-	-	-	-	378,439	10,075	-
4b.1.2.4	Electrical	-	4,168	-	-	-	-	-	625	4,793	-	-	4,793	-	-	-	-	-	-	66,259	-
4b.1.2.5	Electrical - Contaminated	-	1,716	17	32	181	-	-	463	2,409	2,409	-	-	9,508	-	-	-	-	386,137	25,754	-
4b.1.2.6	Electrical - RCA	-	2,460	39	72	410	-	-	691	3,673	3,673	-	-	21,460	-	-	-	-	871,483	37,551	-
4b.1.2.7	Emergency Diesel Generator	-	95	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	1,514	-
4b.1.2.8	Essential Service Water RCA	-	333	17	32	179	-	-	117	677	677	-	-	9,380	-	-	-	-	380,930	4,955	-
4b.1.2.9	Fire Protection	-	307	-	-	-	-	-	46	353	-	-	353	-	-	-	-	-	-	4,983	-
4b.1.2.10	Fire Protection RCA	-	521	12	22	124	-	-	153	832	832	-	-	6,516	-	-	-	-	264,606	7,384	-
4b.1.2.11	Fuel Handling Bldg Equip Drains	-	161	7	7	20	23	-	51	268	268	-	-	1,027	221	-	-	-	60,829	2,404	-
4b.1.2.12	Fuel Handling Bldg Equip Drains (Unit 1)	-	29	1	1	1	4	-	8	44	44	-	-	67	34	-	-	-	5,758	424	-
4b.1.2.13	Fuel Handling Bldg Floor Drains	-	164	7	7	16	25	-	51	270	270	-	-	830	238	-	-	-	54,723	2,441	-
4b.1.2.14	Fuel Handling Bldg Floor Drains (Unit 1)	-	114	4	4	13	11	-	34	181	181	-	-	703	109	-	-	-	37,980	1,740	-
4b.1.2.15	Fuel Pool Cooling & Cleanup	-	218	11	11	24	43	-	72	380	380	-	-	1,275	406	-	-	-	88,160	3,272	-
4b.1.2.16	Fuel Pool Cooling & Cleanup (Unit 1)	-	202	10	10	23	38	-	66	350	350	-	-	1,226	361	-	-	-	82,110	3,050	-
4b.1.2.17	HVAC-Auxiliary Building	-	529	10	19	108	-	-	152	818	818	-	-	5,643	-	-	-	-	229,172	7,876	-
4b.1.2.18	HVAC-Control Room HVAC	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
4b.1.2.19	HVAC-Diesel Generator Room	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	686	-
4b.1.2.20	HVAC-Laboratory	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	315	-
4b.1.2.21	HVAC-Machine Shop	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	297	-
4b.1.2.22	HVAC-Miscellaneous	-	110	-	-	-	-	-	17	127	-	-	127	-	-	-	-	-	-	1,769	-
4b.1.2.23	HVAC-Primary Containment	-	588	19	36	204	-	-	185	1,032	1,032	-	-	10,679	-	-	-	-	433,695	8,624	-
4b.1.2.24	HVAC-Pumphouse	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	275	-
4b.1.2.25	HVAC-Radwaste	-	303	6	11	63	-	-	87	471	471	-	-	3,327	-	-	-	-	135,102	4,323	-
4b.1.2.26	HVAC-Turbine Building	-	186	-	-	-	-	-	28	214	-	-	214	-	-	-	-	-	-	3,158	-
4b.1.2.27	Instrument Air Supply	-	72	-	-	-	-	-	11	83	-	-	83	-	-	-	-	-	-	1,197	-
4b.1.2.28	Instrument Air Supply RCA	-	240	2	3	20	-	-	64	329	329	-	-	1,035	-	-	-	-	42,036	3,563	-
4b.1.2.29	Miscellaneous Drains	-	73	1	2	12	-	-	20	108	108	-	-	617	-	-	-	-	25,043	1,104	-
4b.1.2.30	Primary Containment Purge	-	289	10	20	111	-	-	93	523	523	-	-	5,816	-	-	-	-	236,197	4,524	-

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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
Disposal of Plant Systems (continued)																					
4b.1.2.31	Primary Water	-	801	32	43	187	61	-	253	1,377	1,377	-	-	9,803	667	-	-	-	449,848	12,651	-
4b.1.2.32	Radioactive Waste Disposal	-	2,694	170	139	187	658	-	904	4,752	4,752	-	-	9,780	6,604	-	-	-	954,524	40,174	-
4b.1.2.33	Reactor Bldg Equipment Drains	-	106	8	7	7	37	-	39	203	203	-	-	356	350	-	-	-	45,614	1,581	-
4b.1.2.34	Reactor Building Floor Drains	-	40	2	2	2	7	-	12	65	65	-	-	125	66	-	-	-	11,009	597	-
4b.1.2.35	Reactor Coolant	-	161	8	6	4	32	-	50	260	260	-	-	206	299	-	-	-	35,137	2,391	-
4b.1.2.36	Residual Heat Removal	-	184	11	12	27	43	-	64	340	340	-	-	1,421	405	-	-	-	94,061	2,834	-
4b.1.2.37	Safety Injection	-	841	37	46	172	98	-	271	1,465	1,465	-	-	9,001	979	-	-	-	448,431	13,165	-
4b.1.2.38	Station Air RCA	-	56	1	1	6	-	-	15	78	78	-	-	293	-	-	-	-	11,919	815	-
4b.1.2.39	Station Heating RCA	-	244	4	8	46	-	-	70	373	373	-	-	2,412	-	-	-	-	97,961	3,548	-
4b.1.2.40	Tritium ALPS	-	364	9	17	99	-	-	109	599	599	-	-	5,181	-	-	-	-	210,418	5,732	-
4b.1.2.41	Waste Oil Sumps RCA	-	25	0	1	3	-	-	7	36	36	-	-	154	-	-	-	-	6,246	361	-
4b.1.2.42	Waste Water Treatment	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	1,464	-
4b.1.2	Totals	-	20,969	549	672	2,600	1,321	-	5,605	31,717	25,813	-	5,903	136,237	13,061	-	-	-	6,652,483	319,776	-
4b.1.3	Scaffolding in support of decommissioning	-	2,340	15	3	15	5	-	590	2,968	2,968	-	-	710	44	-	-	-	35,904	39,992	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,937	1,369	182	196	134	604	-	1,529	5,951	5,951	-	-	7,022	8,897	-	-	-	1,144,512	50,361	-
4b.1.4.2	Auxiliary Building	227	116	8	9	17	18	-	151	545	545	-	-	866	322	-	-	-	66,370	5,240	-
4b.1.4.3	Radwaste/Service Building	149	46	6	7	6	15	-	92	320	320	-	-	322	278	-	-	-	40,039	2,959	-
4b.1.4.4	Refueling Water Storage Tank	352	408	4	5	22	6	-	284	1,081	1,081	-	-	1,146	87	-	-	-	54,852	11,906	-
4b.1.4.5	Fuel Handling Building	1,009	1,121	14	17	59	26	-	804	3,051	3,051	-	-	3,097	411	-	-	-	165,831	33,340	-
4b.1.4	Totals	3,673	3,060	214	234	238	669	-	2,861	10,948	10,948	-	-	12,452	9,994	-	-	-	1,471,605	103,806	-
4b.1	Subtotal Period 4b Activity Costs	4,766	26,487	1,091	1,005	2,853	2,585	-	9,825	48,611	42,708	-	5,903	149,399	28,671	-	-	-	8,659,912	465,748	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	ISFSI License Termination	-	36	0	24	-	89	618	127	894	-	894	-	-	1,688	-	-	-	142,260	1,473	1,280
4b.2	Subtotal Period 4b Additional Costs	-	36	0	24	-	89	1,558	410	2,116	1,222	894	-	-	1,688	-	-	-	142,260	1,473	7,520
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	218	-	100	449	-	433	-	295	1,495	1,495	-	-	-	1,555	-	-	-	93,278	303	-
4b.3.2	Small tool allowance	-	497	-	-	-	-	-	74	571	571	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	123	34	127	40	-	46	369	369	-	-	6,000	373	-	-	-	303,507	88	-
4b.3	Subtotal Period 4b Collateral Costs	218	497	223	483	127	472	-	415	2,435	2,435	-	-	6,000	1,928	-	-	-	396,785	391	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	868	-	-	-	-	-	-	217	1,085	1,085	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	909	91	999	999	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	1,351	135	1,486	1,486	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,932	-	-	-	-	-	733	3,665	3,665	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,759	-	-	-	-	-	714	5,472	5,472	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	20	7	-	374	-	97	498	498	-	-	-	6,704	-	-	-	134,081	31	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,675	401	3,076	3,076	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,219	122	1,340	1,340	-	-	-	-	-	-	-	-	-	-
4b.4.9	Site O&M Costs	-	-	-	-	-	-	338	51	388	388	-	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,036	155	1,191	1,191	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	7,645	1,147	8,792	8,792	-	-	-	-	-	-	-	-	-	176,250
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	30,407	4,561	34,967	34,967	-	-	-	-	-	-	-	-	-	377,880
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	50,045	7,507	57,552	57,552	-	-	-	-	-	-	-	-	-	665,520
4b.4	Subtotal Period 4b Period-Dependent Costs	868	7,691	20	7	-	374	95,624	15,930	120,513	120,513	-	-	-	6,704	-	-	-	134,081	31	1,219,650
4b.0	TOTAL PERIOD 4b COST	5,852	34,711	1,333	1,518	2,980	3,520	97,181	26,580	173,676	166,878	894	5,903	155,399	38,991	-	-	-	9,333,038	467,643	1,227,170

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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 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	-	-	-	-	-	-	8,222	2,467	10,688	10,688	-	-	-	-	-	-	-	-	131,983	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	8,222	2,467	10,688	10,688	-	-	-	-	-	-	-	-	131,983	3,120
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	763	-	-	-	-	-	191	954	954	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	19	-	5	25	25	-	-	-	335	-	-	-	6,698	2	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	355	35	390	390	-	-	-	-	-	-	-	-	-	-
4e.4.7	Site O&M Costs	-	-	-	-	-	-	94	14	108	108	-	-	-	-	-	-	-	-	-	-
4e.4.8	Security Staff Cost	-	-	-	-	-	-	527	79	606	606	-	-	-	-	-	-	-	-	-	11,786
4e.4.9	DOC Staff Cost	-	-	-	-	-	-	3,801	570	4,371	4,371	-	-	-	-	-	-	-	-	-	46,750
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	4,551	683	5,234	5,234	-	-	-	-	-	-	-	-	-	56,964
4e.4	Subtotal Period 4e Period-Dependent Costs	-	763	1	0	-	19	9,902	1,644	12,330	12,330	-	-	-	335	-	-	-	6,698	2	115,500
4e.0	TOTAL PERIOD 4e COST	-	763	1	0	-	19	19,406	4,326	24,515	24,515	-	-	-	335	-	-	-	6,698	131,985	118,620
PERIOD 4 TOTALS		6,369	63,836	8,729	5,784	4,347	29,276	162,794	56,681	337,816	324,877	894	12,045	229,222	79,669	3,130	459	505	17,035,810	878,577	1,928,505
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	6,763	-	-	-	-	-	1,014	7,778	-	-	7,778	-	-	-	-	-	-	69,546	-
5b.1.1.2	Aux Feedwater-Steam Tunnel/Penetr. Area	-	689	-	-	-	-	-	103	792	-	-	792	-	-	-	-	-	-	5,186	-
5b.1.1.3	Auxiliary Building	-	5,899	-	-	-	-	-	885	6,784	-	-	6,784	-	-	-	-	-	-	62,063	-
5b.1.1.4	Blowdown Outfall Structure	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	295	-
5b.1.1.5	Bottled Gas Storage	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	340	-
5b.1.1.6	Circulating Water Discharge	-	233	-	-	-	-	-	35	268	-	-	268	-	-	-	-	-	-	2,887	-
5b.1.1.7	Gatehouse and Extension	-	333	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	4,193	-
5b.1.1.8	Instrument Maintenance Building	-	94	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	1,190	-
5b.1.1.9	Lake Screen House	-	1,494	-	-	-	-	-	224	1,718	-	-	1,718	-	-	-	-	-	-	15,283	-
5b.1.1.10	Make-up Demineralizer Area	-	647	-	-	-	-	-	97	744	-	-	744	-	-	-	-	-	-	8,158	-
5b.1.1.11	Miscellaneous Warehouses	-	1,991	-	-	-	-	-	299	2,290	-	-	2,290	-	-	-	-	-	-	26,794	-
5b.1.1.12	Miscellaneous Yard Structures	-	1,254	-	-	-	-	-	188	1,442	-	-	1,442	-	-	-	-	-	-	14,693	-
5b.1.1.13	Radwaste/Service Building	-	3,927	-	-	-	-	-	589	4,516	-	-	4,516	-	-	-	-	-	-	45,685	-
5b.1.1.14	Receiving Building	-	183	-	-	-	-	-	27	210	-	-	210	-	-	-	-	-	-	2,292	-
5b.1.1.15	Refueling Water Storage Tank	-	1,028	-	-	-	-	-	154	1,182	-	-	1,182	-	-	-	-	-	-	11,692	-
5b.1.1.16	River Screen House	-	616	-	-	-	-	-	92	708	-	-	708	-	-	-	-	-	-	6,844	-
5b.1.1.17	Security Modifications	-	959	-	-	-	-	-	144	1,103	-	-	1,103	-	-	-	-	-	-	6,939	-
5b.1.1.18	Sewage Treatment Plant	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,326	-
5b.1.1.19	Tech Support Center & Cond Cleanup Bldg	-	499	-	-	-	-	-	75	574	-	-	574	-	-	-	-	-	-	6,095	-
5b.1.1.20	Turbine Building	-	5,769	-	-	-	-	-	865	6,634	-	-	6,634	-	-	-	-	-	-	70,342	-
5b.1.1.21	Turbine Pedestal	-	1,352	-	-	-	-	-	203	1,555	-	-	1,555	-	-	-	-	-	-	12,628	-
5b.1.1.22	Waste Treatment Building	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	1,265	-

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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
Demolition of Remaining Site Buildings (continued)																					
5b.1.1.23	Fuel Handling Building	-	3,039	-	-	-	-	-	456	3,495	-	-	3,495	-	-	-	-	-	-	33,245	-
5b.1.1	Totals	-	37,032	-	-	-	-	-	5,555	42,587	-	-	42,587	-	-	-	-	-	-	408,981	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	237	-	-	-	-	-	35	272	-	-	272	-	-	-	-	-	-	1,367	-
5b.1.3	Grade & landscape site	-	716	-	-	-	-	-	107	823	-	-	823	-	-	-	-	-	-	1,942	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	79	12	91	91	-	-	-	-	-	-	-	-	-	668
5b.1	Subtotal Period 5b Activity Costs	-	37,984	-	-	-	-	79	5,709	43,772	91	-	43,681	-	-	-	-	-	-	412,290	668
Period 5b Additional Costs																					
5b.2.1	ISFSI Demolition and Site Restoration	-	516	-	-	-	-	24	81	622	-	622	-	-	-	-	-	-	-	5,235	80
5b.2.2	Cofferdam Construction and Teardown	-	778	-	-	-	-	-	117	894	-	-	894	-	-	-	-	-	-	7,391	-
5b.2.3	Concrete Crushing	-	1,020	-	-	-	-	5	154	1,179	-	-	1,179	-	-	-	-	-	-	4,730	-
5b.2	Subtotal Period 5b Additional Costs	-	2,314	-	-	-	-	29	352	2,695	-	622	2,074	-	-	-	-	-	-	17,356	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	465	-	-	-	-	-	70	534	-	-	534	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	465	-	-	-	-	-	70	534	-	-	534	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,239	124	1,363	-	-	1,363	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,239	-	-	-	-	-	936	7,174	-	-	7,174	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	327	49	376	-	-	376	-	-	-	-	-	-	-	-
5b.4.5	Site O&M Cost	-	-	-	-	-	-	310	46	356	-	-	356	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	1,561	234	1,795	-	-	1,795	-	-	-	-	-	-	-	34,287
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	11,650	1,748	13,398	-	-	13,398	-	-	-	-	-	-	-	137,043
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,559	834	6,392	-	-	6,392	-	-	-	-	-	-	-	67,229
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,239	-	-	-	-	20,645	3,971	30,855	-	-	30,855	-	-	-	-	-	-	-	238,558
5b.0	TOTAL PERIOD 5b COST	-	47,001	-	-	-	-	20,753	10,101	77,856	91	622	77,144	-	-	-	-	-	-	429,646	239,306
PERIOD 5 TOTALS		-	47,001	-	-	-	-	20,753	10,101	77,856	91	622	77,144	-	-	-	-	-	-	429,646	239,306
TOTAL COST TO DECOMMISSION		13,113	116,635	8,955	6,691	4,347	30,627	435,514	108,026	723,907	511,430	122,649	89,829	229,222	91,491	3,130	459	505	17,396,570	1,398,752	4,896,472

Table D-2
Braidwood Nuclear Power Station, Unit 2
Delayed 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

TOTAL COST TO DECOMMISSION WITH 17.54% CONTINGENCY:	$723,907	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 70.65% OR:	$511,430	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 16.94% OR:	$122,649	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 12.41% OR:	$89,829	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	95,080	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	76,977	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,398,752	man-hours

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

APPENDIX E

DETAILED COST ANALYSIS

SAFSTOR

Page

Braidwood Nuclear Power Station, Unit 1 ..... E-2

Braidwood Nuclear Power Station, Unit 2 ..... E-13

Table E-1
Braidwood Nuclear Power Station, 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	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 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	398	119	517	517	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	177	27	204	204	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	590	89	679	679	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	581	87	668	668	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	492	74	565	565	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	1,913	287	2,199	2,199	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	140	21	161	161	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	142	21	163	163	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	281	42	323	323	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	4,633	755	5,388	5,388	-	-	-	-	-	-	-	-	-	35,890
Period 1a Additional Costs																					
1a.2.1	ISFSI Expansion	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	9,000	1,350	10,350	-	10,350	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	9,000	1,350	10,350	-	10,350	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	751	75	826	826	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	421	-	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	706	71	776	776	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	315	32	347	-	347	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	381	57	438	-	438	-	-	-	-	-	-	-	-	-

Table E-1
Braidwood Nuclear Power Station, 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	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 1a Period-Dependent Costs (continued)																					
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	466	70	536	536	-	-	-	-	-	-	-	-	-	12,264
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	31,082	4,662	35,745	35,745	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	842	2	1	-	34	35,189	5,367	41,434	40,599	836	-	-	610	-	-	-	12,190	3	435,664
1a.0	TOTAL PERIOD 1a COST	-	842	2	1	-	34	58,722	8,957	68,557	45,986	22,571	-	-	610	-	-	-	12,190	3	471,554
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	2,135	-	-	-	-	-	-	1,067	3,202	3,202	-	-	-	-	-	-	-	-	33,093	-
1b.1.1.2	Auxiliary Building	211	-	-	-	-	-	-	106	317	317	-	-	-	-	-	-	-	-	3,289	-
1b.1.1.3	Refueling Water Storage Tank	351	-	-	-	-	-	-	176	527	527	-	-	-	-	-	-	-	-	5,322	-
1b.1.1.4	Steam Generator Storage Facility	57	-	-	-	-	-	-	29	86	86	-	-	-	-	-	-	-	-	887	-
1b.1.1	Totals	2,754	-	-	-	-	-	-	1,377	4,131	4,131	-	-	-	-	-	-	-	-	42,591	-
1b.1	Subtotal Period 1b Activity Costs	2,754	-	-	-	-	-	-	1,377	4,131	4,131	-	-	-	-	-	-	-	-	42,591	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	185	-	81	364	-	351	-	243	1,223	1,223	-	-	-	1,259	-	-	-	75,560	246	-
1b.3.3	Small tool allowance	-	45	-	-	-	-	-	7	51	51	-	-	-	-	-	-	-	-	-	-
1b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,000	300	2,300	-	2,300	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	996	45	81	364	-	351	2,000	671	4,507	2,207	2,300	-	-	1,259	-	-	-	75,560	246	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	588	-	-	-	-	-	-	147	735	735	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	270	-	-	-	-	-	68	338	338	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	2	1	-	29	-	8	39	39	-	-	-	526	-	-	-	10,515	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	176	18	194	194	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	116	17	134	134	-	-	-	-	-	-	-	-	-	3,058
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,252	1,088	8,340	8,340	-	-	-	-	-	-	-	-	-	99,429
1b.4	Subtotal Period 1b Period-Dependent Costs	588	375	2	1	-	29	9,889	1,619	12,502	12,294	208	-	-	526	-	-	-	10,515	2	102,487
1b.0	TOTAL PERIOD 1b COST	4,338	420	83	364	-	380	11,889	3,667	21,140	18,632	2,508	-	-	1,785	-	-	-	86,076	42,839	102,487
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	457	-	-	-	-	-	69	525	525	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	13,416	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	69	10	79	79	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	504	-	-	-	-	802	306	1,612	1,612	-	-	-	-	-	-	-	-	17,116	583

Table E-1
Braidwood Nuclear Power Station, 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	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 1c Collateral Costs																					
1c.3.1	Process liquid waste	150	-	66	296	-	285	-	197	995	995	-	-	-	1,024	-	-	-	61,469	200	-
1c.3.2	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,000	300	2,300	-	2,300	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	150	4	66	296	-	285	2,000	498	3,300	1,000	2,300	-	-	1,024	-	-	-	61,469	200	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	143	-	-	-	-	-	36	179	179	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	6	-	1	7	7	-	-	-	99	-	-	-	1,976	0	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	176	18	194	194	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1c.4.9	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	116	17	134	134	-	-	-	-	-	-	-	-	-	3,058
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	1,073	161	1,234	1,234	-	-	-	-	-	-	-	-	-	13,520
1c.4	Subtotal Period 1c Period-Dependent Costs	-	248	0	0	-	6	3,709	507	4,470	4,261	208	-	-	99	-	-	-	1,976	0	16,578
1c.0	TOTAL PERIOD 1c COST	150	757	66	296	-	291	6,511	1,311	9,382	6,873	2,508	-	-	1,123	-	-	-	63,445	17,316	17,161
PERIOD 1 TOTALS		4,489	2,018	151	661	-	705	77,122	13,934	99,079	71,491	27,587	-	-	3,518	-	-	-	161,711	60,157	591,202
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	-	-	-	-	-	-	17	3	20	20	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	503	126	629	629	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	520	128	649	649	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	34,000	5,100	39,100	-	39,100	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	34,000	5,100	39,100	-	39,100	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,345	134	1,479	1,296	184	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	7,726	773	8,499	2,200	6,299	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	324	-	-	-	-	-	81	405	405	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	5	2	-	85	-	22	114	114	-	-	-	1,531	-	-	-	30,618	7	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,056	158	1,214	607	607	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	807	81	887	887	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	400	40	440	-	440	-	-	-	-	-	-	-	-	-
2a.4.8	Site O&M Costs	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	1,526	229	1,755	-	1,755	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	176	26	202	-	202	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	6,476	971	7,447	3,541	3,907	-	-	-	-	-	-	-	-	157,287
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	9,434	1,415	10,849	4,321	6,527	-	-	-	-	-	-	-	-	121,054
2a.4	Subtotal Period 2a Period-Dependent Costs	-	324	5	2	-	85	29,445	4,006	33,867	13,946	19,921	-	-	1,531	-	-	-	30,618	7	278,341
2a.0	TOTAL PERIOD 2a COST	-	324	5	2	-	85	63,965	9,234	73,615	14,595	59,021	-	-	1,531	-	-	-	30,618	7	278,341

Table E-1
Braidwood Nuclear Power Station, 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	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 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	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	1,724	431	2,155	2,155	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	1,783	440	2,223	2,223	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,500	1,125	8,625	-	8,625	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	7,500	1,125	8,625	-	8,625	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	4,169	417	4,586	4,441	145	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	6,854	685	7,540	7,540	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,065	-	-	-	-	-	266	1,331	1,331	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	15	6	-	288	-	74	383	383	-	-	-	5,164	-	-	-	103,276	24	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	1,809	271	2,081	2,081	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	2,764	276	3,041	3,041	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,371	137	1,508	-	1,508	-	-	-	-	-	-	-	-	-
2b.4.8	Site O&M Costs	-	-	-	-	-	-	1,714	257	1,971	1,971	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	603	90	693	-	693	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	15,623	2,343	17,966	12,134	5,832	-	-	-	-	-	-	-	-	353,351
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	19,652	2,948	22,600	14,810	7,791	-	-	-	-	-	-	-	-	271,522
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,065	15	6	-	288	54,560	7,767	63,700	47,731	15,969	-	-	5,164	-	-	-	103,276	24	624,874
2b.0	TOTAL PERIOD 2b COST	-	1,065	15	6	-	288	63,843	9,332	74,548	49,954	24,594	-	-	5,164	-	-	-	103,276	24	624,874
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	-	-	-	-	-	-	145	22	167	167	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	4,246	1,061	5,307	5,307	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	4,391	1,083	5,474	5,474	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	9,940	994	10,934	10,934	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	16,877	1,688	18,564	18,564	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,551	-	-	-	-	-	638	3,189	3,189	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	37	14	-	702	-	181	935	935	-	-	-	12,588	-	-	-	251,751	58	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	4,455	668	5,124	5,124	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	6,163	616	6,779	6,779	-	-	-	-	-	-	-	-	-	-
2c.4.7	Site O&M Costs	-	-	-	-	-	-	4,219	633	4,852	4,852	-	-	-	-	-	-	-	-	-	-
2c.4.8	Security Staff Cost	-	-	-	-	-	-	25,980	3,897	29,877	29,877	-	-	-	-	-	-	-	-	-	528,343
2c.4.9	Utility Staff Cost	-	-	-	-	-	-	31,708	4,756	36,464	36,464	-	-	-	-	-	-	-	-	-	449,444
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,551	37	14	-	702	99,341	14,071	116,717	116,717	-	-	-	12,588	-	-	-	251,751	58	977,786
2c.0	TOTAL PERIOD 2c COST	-	2,551	37	14	-	702	103,732	15,154	122,190	122,190	-	-	-	12,588	-	-	-	251,751	58	977,786
PERIOD 2 TOTALS		-	3,940	57	21	-	1,076	231,540	33,720	270,354	186,739	83,614	-	-	19,282	-	-	-	385,645	88	1,881,001

Table E-1
Braidwood Nuclear Power Station, 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	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 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	153	23	176	176	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	885	133	1,018	1,018	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	366	55	421	421	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	590	89	679	679	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	483	73	556	556	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	870	130	1,000	900	-	100	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	492	74	565	509	-	57	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	838	126	964	964	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	767	115	882	882	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	59	9	68	68	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	189	28	217	109	-	109	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	47	7	54	-	-	54	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	368	55	423	212	-	212	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	106	16	122	61	-	61	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	4,694	704	5,398	4,752	-	646	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	283	42	326	326	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	145	22	167	167	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	13,580	2,037	15,617	14,970	-	646	-	-	-	-	-	-	-	72,703
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	294	29	324	324	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	500	50	550	550	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	368	-	-	-	-	-	92	460	460	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	2	1	-	29	-	7	38	38	-	-	-	514	-	-	-	10,287	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	249	25	274	274	-	-	-	-	-	-	-	-	-	-
3a.4.8	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	2,827	424	3,251	3,251	-	-	-	-	-	-	-	-	-	65,179
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	19,293	2,894	22,187	22,187	-	-	-	-	-	-	-	-	-	258,629
3a.4	Subtotal Period 3a Period-Dependent Costs	-	789	2	1	-	29	24,607	3,801	29,228	29,228	-	-	-	514	-	-	-	10,287	2	323,807
3a.0	TOTAL PERIOD 3a COST	-	789	2	1	-	29	38,187	5,838	44,845	44,198	-	646	-	514	-	-	-	10,287	2	396,510

Table E-1
Braidwood Nuclear Power Station, 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	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 - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	559	84	642	578	-	64	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	295	44	339	339	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	159	24	183	46	-	137	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	118	18	136	136	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	428	64	493	493	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	142	21	163	81	-	81	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	53	8	61	61	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	142	21	163	163	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	543	81	624	624	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	118	18	136	68	-	68	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	184	28	212	-	-	212	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	184	28	212	-	-	212	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	322	48	370	333	-	37	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	322	48	370	333	-	37	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,805	571	4,376	3,527	-	848	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,805	571	4,376	3,527	-	848	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	6,341	1,902	8,243	8,243	-	-	-	-	-	-	-	-	30,500	10,852
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	6,341	1,902	8,243	8,243	-	-	-	-	-	-	-	-	30,500	10,852
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	811	1,100	-	-	-	-	1,130	456	3,497	3,497	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	25	-	-	-	-	-	-	6	31	31	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	168	17	185	185	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	251	25	276	276	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	203	-	-	-	-	-	51	254	254	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	211	-	-	-	-	-	32	242	242	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	1	0	-	16	-	4	22	22	-	-	-	292	-	-	-	5,834	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	661	99	761	761	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	125	12	137	137	-	-	-	-	-	-	-	-	-	-
3b.4.9	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	1,417	213	1,630	1,630	-	-	-	-	-	-	-	-	-	32,679
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	4,781	717	5,498	5,498	-	-	-	-	-	-	-	-	-	58,560
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	9,673	1,451	11,124	11,124	-	-	-	-	-	-	-	-	-	129,669
3b.4	Subtotal Period 3b Period-Dependent Costs	25	414	1	0	-	16	17,139	2,637	20,233	20,233	-	-	-	292	-	-	-	5,834	1	220,907
3b.0	TOTAL PERIOD 3b COST	836	1,514	1	0	-	16	28,415	5,566	36,348	35,500	-	848	-	292	-	-	-	5,834	30,501	264,002
PERIOD 3 TOTALS		836	2,303	2	1	-	45	66,602	11,404	81,193	79,698	-	1,495	-	806	-	-	-	16,121	30,504	660,512

Table E-1
Braidwood Nuclear Power Station, 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	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 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	46	160	33	21	45	170	-	119	594	594	-	-	864	864	-	-	-	200,408	3,290	-
4a.1.1.2	Pressurizer Relief Tank	8	29	6	4	9	30	-	21	107	107	-	-	165	165	-	-	-	36,553	596	-
4a.1.1.3	Reactor Coolant Pumps & Motors	28	105	57	168	-	1,272	-	389	2,018	2,018	-	-	-	4,796	-	-	-	780,540	2,726	80
4a.1.1.4	Pressurizer	12	68	347	94	-	412	-	175	1,108	1,108	-	-	-	3,033	-	-	-	252,826	1,527	750
4a.1.1.5	Steam Generators	94	4,168	2,158	2,533	667	4,349	-	2,872	16,841	16,841	-	-	45,513	17,359	-	-	-	3,811,289	20,508	1,500
4a.1.1.6	Retired Steam Generator Units	-	-	1,486	2,673	580	3,416	-	1,491	9,646	9,646	-	-	39,289	14,064	-	-	-	3,041,432	10,800	1,500
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	22	80	176	31	-	59	-	68	436	436	-	-	-	2,843	-	-	-	50,181	1,648	-
4a.1.1.8	Reactor Vessel Internals	75	2,001	3,442	525	-	3,710	203	4,416	14,372	14,372	-	-	-	2,211	376	470	-	325,254	23,067	1,055
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	11,837	-	1,776	13,613	13,613	-	-	-	-	-	-	505	104,146	-	-
4a.1.1.10	Reactor Vessel	90	3,970	1,283	670	-	2,976	203	5,029	14,221	14,221	-	-	-	6,672	2,254	-	-	979,179	23,067	1,055
4a.1.1	Totals	374	10,580	8,989	6,718	1,301	28,232	406	16,354	72,955	72,955	-	-	85,831	52,007	2,629	470	505	9,581,808	87,228	5,939
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	574	262	32	214	-	-	207	1,288	1,288	-	-	5,355	-	-	-	-	455,213	9,016	-
4a.1.3	Main Condensers	-	1,176	136	27	150	-	-	334	1,823	1,823	-	-	7,111	-	-	-	-	320,000	18,250	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,171	-	-	-	-	-	176	1,346	1,346	-	-	-	-	-	-	-	-	12,130	-
4a.1.4.2	Auxiliary Building	-	644	-	-	-	-	-	97	741	741	-	-	-	-	-	-	-	-	6,782	-
4a.1.4.3	Refueling Water Storage Tank	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,299	-
4a.1.4.4	Steam Generator Storage Facility	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	507	-
4a.1.4	Totals	-	1,977	-	-	-	-	-	297	2,273	2,273	-	-	-	-	-	-	-	-	20,718	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwater	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	1,244	-
4a.1.5.2	Auxiliary Steam	-	70	-	-	-	-	-	10	80	-	-	80	-	-	-	-	-	-	1,126	-
4a.1.5.3	Auxiliary Steam RCA	-	134	2	3	16	-	-	36	190	190	-	-	835	-	-	-	-	33,900	1,935	-
4a.1.5.4	Boric Acid Processing	-	492	33	31	86	99	-	169	912	912	-	-	4,531	1,193	-	-	-	268,274	7,890	-
4a.1.5.5	CO2 & H2	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	419	-
4a.1.5.6	CO2 & H2 RCA	-	38	0	1	3	-	-	10	52	52	-	-	164	-	-	-	-	6,658	572	-
4a.1.5.7	Chemical Feed	-	57	-	-	-	-	-	9	66	-	-	66	-	-	-	-	-	-	934	-
4a.1.5.8	Chilled Water	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,142	-
4a.1.5.9	Circulating Water	-	318	-	-	-	-	-	48	365	-	-	365	-	-	-	-	-	-	5,174	-
4a.1.5.10	Condensate	-	377	-	-	-	-	-	56	433	-	-	433	-	-	-	-	-	-	6,023	-
4a.1.5.11	Condensate Booster	-	339	-	-	-	-	-	51	390	-	-	390	-	-	-	-	-	-	5,428	-
4a.1.5.12	Condensate Cleanup	-	66	-	-	-	-	-	10	76	-	-	76	-	-	-	-	-	-	1,060	-
4a.1.5.13	Containment Spray	-	256	7	12	69	-	-	77	421	421	-	-	3,629	-	-	-	-	147,367	3,729	-
4a.1.5.14	Diesel Fuel Oil	-	102	-	-	-	-	-	15	117	-	-	117	-	-	-	-	-	-	1,615	-
4a.1.5.15	Essential Service Water	-	236	-	-	-	-	-	35	271	-	-	271	-	-	-	-	-	-	3,837	-
4a.1.5.16	Extraction Steam	-	189	-	-	-	-	-	28	217	-	-	217	-	-	-	-	-	-	3,089	-
4a.1.5.17	Feedwater	-	316	-	-	-	-	-	47	363	-	-	363	-	-	-	-	-	-	5,142	-
4a.1.5.18	Feedwater Drains	-	758	-	-	-	-	-	114	872	-	-	872	-	-	-	-	-	-	12,366	-
4a.1.5.19	Gland Steam	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	932	-
4a.1.5.20	Gland Water	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	828	-
4a.1.5.21	Main Steam	-	322	-	-	-	-	-	48	371	-	-	371	-	-	-	-	-	-	5,216	-
4a.1.5.22	Main Steam RCA	-	51	1	3	15	-	-	15	85	85	-	-	760	-	-	-	-	30,853	739	-
4a.1.5.23	Nitrogen	-	3	0	0	1	-	-	1	5	5	-	-	52	-	-	-	-	2,102	49	-
4a.1.5.24	Non-Essential Service Water	-	178	-	-	-	-	-	27	204	-	-	204	-	-	-	-	-	-	2,916	-
4a.1.5.25	Non-Essential Service Water RCA	-	93	3	5	28	-	-	29	158	158	-	-	1,462	-	-	-	-	59,354	1,295	-
4a.1.5.26	Off Gas	-	563	10	19	106	-	-	160	858	858	-	-	5,572	-	-	-	-	226,266	8,494	-
4a.1.5.27	Process Radiation Monitoring	-	40	0	0	2	-	-	11	54	54	-	-	113	-	-	-	-	4,587	666	-
4a.1.5.28	Process Sampling	-	119	1	2	12	-	-	32	166	166	-	-	616	-	-	-	-	25,019	1,927	-
4a.1.5.29	Screen Wash	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	821	-
4a.1.5.30	Station Air	-	31	-	-	-	-	-	5	35	-	-	35	-	-	-	-	-	-	498	-

Table E-1
Braidwood Nuclear Power Station, 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	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
Disposal of Plant Systems (continued)																					
4a.1.5.31	Station Heating	-	109	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	1,771	-
4a.1.5.32	Switchgear Heat Removal	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	139	-
4a.1.5.33	Turbine Bldg Equip Drains	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	17	-
4a.1.5.34	Turbine Generator	-	57	-	-	-	-	-	9	65	-	-	65	-	-	-	-	-	-	901	-
4a.1.5.35	Turbine Oil	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	1,399	-
4a.1.5.36	Waste Oil Sumps	-	30	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	483	-
4a.1.5	Totals	-	5,772	57	76	338	99	-	1,137	7,480	2,900	-	4,580	17,732	1,193	-	-	-	804,381	91,814	-
4a.1.6	Scaffolding in support of decommissioning	-	1,060	6	1	6	2	-	267	1,343	1,343	-	-	306	19	-	-	-	15,459	18,101	-
4a.1	Subtotal Period 4a Activity Costs	374	21,137	9,451	6,854	2,010	28,334	406	18,596	87,163	82,583	-	4,580	116,335	53,219	2,629	470	505	11,176,860	245,127	5,939
Period 4a Collateral Costs																					
4a.3.1	Process liquid waste	35	-	18	80	-	77	-	50	260	260	-	-	-	276	-	-	-	16,582	54	-
4a.3.2	Small tool allowance	-	235	-	-	-	-	-	35	270	243	-	27	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	35	235	18	80	-	77	-	86	530	503	-	27	-	276	-	-	-	16,582	54	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	65	-	-	-	-	-	-	16	81	81	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	438	44	482	482	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	652	65	717	645	-	72	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,497	-	-	-	-	-	374	1,871	1,871	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,314	-	-	-	-	-	347	2,661	2,661	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	9	3	-	172	-	44	229	229	-	-	-	3,088	-	-	-	61,756	14	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,634	245	1,879	1,879	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	858	86	944	944	-	-	-	-	-	-	-	-	-	-
4a.4.9	Site O&M Costs	-	-	-	-	-	-	163	24	187	187	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	500	75	574	574	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	2,869	430	3,299	3,299	-	-	-	-	-	-	-	-	-	75,426
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,948	2,242	17,191	17,191	-	-	-	-	-	-	-	-	-	186,946
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	24,875	3,731	28,607	28,607	-	-	-	-	-	-	-	-	-	335,158
4a.4	Subtotal Period 4a Period-Dependent Costs	65	3,811	9	3	-	172	46,937	7,725	58,722	58,650	-	72	-	3,088	-	-	-	61,756	14	597,530
4a.0	TOTAL PERIOD 4a COST	474	25,183	9,478	6,937	2,010	28,583	47,343	26,407	146,415	141,736	-	4,679	116,335	56,583	2,629	470	505	11,255,200	245,195	603,469
PERIOD 4b - Site Decontamination																					
Disposal of Plant Systems																					
4b.1.2.1	Chemical & Volume Control	-	1,095	64	47	33	255	-	356	1,851	1,851	-	-	1,744	2,431	-	-	-	287,102	16,313	-
4b.1.2.2	Chilled Water RCA	-	311	9	16	90	-	-	95	520	520	-	-	4,716	-	-	-	-	191,536	4,732	-
4b.1.2.3	Component Cooling RCA	-	661	16	29	164	-	-	196	1,066	1,066	-	-	8,589	-	-	-	-	348,801	9,675	-
4b.1.2.4	Electrical	-	3,047	-	-	-	-	-	457	3,504	-	-	3,504	-	-	-	-	-	-	48,490	-
4b.1.2.5	Electrical - Contaminated	-	1,128	12	23	128	-	-	306	1,597	1,597	-	-	6,722	-	-	-	-	272,965	17,115	-
4b.1.2.6	Electrical - RCA	-	1,881	32	59	335	-	-	532	2,839	2,839	-	-	17,555	-	-	-	-	712,922	29,098	-
4b.1.2.7	Emergency Diesel Generator	-	129	-	-	-	-	-	19	148	-	-	148	-	-	-	-	-	-	2,066	-
4b.1.2.8	Essential Service Water RCA	-	297	10	17	99	-	-	93	515	515	-	-	5,177	-	-	-	-	210,230	4,418	-
4b.1.2.9	Fire Protection	-	122	-	-	-	-	-	18	141	-	-	141	-	-	-	-	-	-	1,984	-
4b.1.2.10	Fire Protection RCA	-	180	2	3	20	-	-	49	254	254	-	-	1,037	-	-	-	-	42,116	2,577	-
4b.1.2.11	HVAC-Auxiliary Building	-	486	9	17	96	-	-	139	747	747	-	-	5,054	-	-	-	-	205,243	7,162	-
4b.1.2.12	HVAC-Diesel Generator Room	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	682	-
4b.1.2.13	HVAC-Miscellaneous	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	656	-
4b.1.2.14	HVAC-Primary Containment	-	588	19	36	204	-	-	185	1,032	1,032	-	-	10,679	-	-	-	-	433,695	8,624	-
4b.1.2.15	HVAC-Turbine Building	-	187	-	-	-	-	-	28	215	-	-	215	-	-	-	-	-	-	3,177	-
4b.1.2.16	Instrument Air Supply	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	760	-
4b.1.2.17	Instrument Air Supply RCA	-	73	1	1	7	-	-	20	102	102	-	-	366	-	-	-	-	14,869	1,073	-
4b.1.2.18	Miscellaneous Drains	-	38	1	1	6	-	-	11	57	57	-	-	312	-	-	-	-	12,666	584	-
4b.1.2.19	Primary Containment Purge	-	274	10	20	112	-	-	89	504	504	-	-	5,850	-	-	-	-	237,590	4,312	-
4b.1.2.20	Primary Water	-	59	1	1	3	4	-	17	86	86	-	-	143	42	-	-	-	9,560	915	-

Table E-1
Braidwood Nuclear Power Station, 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	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
Disposal of Plant Systems (continued)																					
4b.1.2.21	Radioactive Waste Disposal	-	899	46	39	81	154	-	286	1,504	1,504	-	-	4,235	1,622	-	-	-	302,491	14,169	-
4b.1.2.22	Reactor Building Equipment Drains	-	97	7	5	3	29	-	33	175	175	-	-	183	277	-	-	-	32,048	1,435	-
4b.1.2.23	Reactor Building Floor Drains	-	45	2	2	2	8	-	14	73	73	-	-	130	74	-	-	-	11,914	678	-
4b.1.2.24	Reactor Coolant	-	169	9	6	4	34	-	53	276	276	-	-	208	324	-	-	-	37,451	2,506	-
4b.1.2.25	Residual Heat Removal	-	190	11	12	28	44	-	66	351	351	-	-	1,453	418	-	-	-	96,526	2,924	-
4b.1.2.26	Safety Injection	-	865	38	48	175	103	-	279	1,509	1,509	-	-	9,181	1,028	-	-	-	460,142	13,528	-
4b.1.2.27	Station Air RCA	-	36	0	1	3	-	-	9	49	49	-	-	175	-	-	-	-	7,089	521	-
4b.1.2.28	Station Heating RCA	-	120	2	4	24	-	-	34	184	184	-	-	1,256	-	-	-	-	51,005	1,759	-
4b.1.2.29	Waste Oil Sumps RCA	-	7	0	0	1	-	-	2	10	10	-	-	52	-	-	-	-	2,098	92	-
4b.1.2	Totals	-	13,115	301	388	1,619	632	-	3,406	19,461	15,302	-	4,159	84,817	6,216	-	-	-	3,980,059	202,024	-
4b.1.3	Scaffolding in support of decommissioning	-	1,589	9	2	10	3	-	401	2,014	2,014	-	-	458	29	-	-	-	23,188	27,151	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,937	1,369	176	195	134	455	-	1,491	5,757	5,757	-	-	7,022	8,433	-	-	-	1,122,380	50,350	-
4b.1.4.2	Auxiliary Building	194	103	6	7	17	13	-	130	470	470	-	-	866	229	-	-	-	57,065	4,554	-
4b.1.4.3	Refueling Water Storage Tank	352	408	4	5	22	6	-	284	1,081	1,081	-	-	1,146	87	-	-	-	54,852	11,906	-
4b.1.4.4	Steam Generator Storage Facility	57	0	0	0	0	0	-	29	86	86	-	-	1	0	-	-	-	40	888	-
4b.1.4	Totals	2,540	1,880	186	208	172	474	-	1,934	7,393	7,393	-	-	9,034	8,749	-	-	-	1,234,338	67,698	-
4b.1	Subtotal Period 4b Activity Costs	2,540	16,585	496	597	1,801	1,109	-	5,741	28,868	24,710	-	4,159	94,309	14,993	-	-	-	5,237,585	296,874	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	ISFSI License Termination	-	41	1	24	-	90	719	144	1,018	-	1,018	-	-	1,703	-	-	-	142,573	2,775	1,280
4b.2	Subtotal Period 4b Additional Costs	-	41	1	24	-	90	1,659	426	2,240	1,222	1,018	-	-	1,703	-	-	-	142,573	2,775	7,520
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	42	-	22	98	-	94	-	61	317	317	-	-	-	338	-	-	-	20,267	66	-
4b.3.2	Small tool allowance	-	306	-	-	-	-	-	46	352	352	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	123	34	127	40	-	46	369	369	-	-	6,000	373	-	-	-	303,507	88	-
4b.3	Subtotal Period 4b Collateral Costs	42	306	144	131	127	134	-	154	1,038	1,038	-	-	6,000	711	-	-	-	323,774	154	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	686	-	-	-	-	-	-	171	857	857	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	745	74	819	819	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	1,107	111	1,218	1,218	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,997	-	-	-	-	-	499	2,496	2,496	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	3,900	-	-	-	-	-	585	4,486	4,486	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	13	5	-	241	-	62	321	321	-	-	-	4,321	-	-	-	86,419	20	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,193	329	2,522	2,522	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,459	146	1,605	1,605	-	-	-	-	-	-	-	-	-	-
4b.4.9	Site O&M Costs	-	-	-	-	-	-	277	42	318	318	-	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	849	127	976	976	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	967	145	1,112	1,112	-	-	-	-	-	-	-	-	-	25,426
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	16,431	2,465	18,895	18,895	-	-	-	-	-	-	-	-	-	217,274
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	27,621	4,143	31,764	31,764	-	-	-	-	-	-	-	-	-	388,320
4b.4	Subtotal Period 4b Period-Dependent Costs	686	5,897	13	5	-	241	51,648	8,900	67,390	67,390	-	-	-	4,321	-	-	-	86,419	20	631,020
4b.0	TOTAL PERIOD 4b COST	3,268	22,829	653	757	1,928	1,573	53,307	15,220	99,536	94,359	1,018	4,159	100,309	21,728	-	-	-	5,790,351	299,823	638,540
PERIOD 4d - Delay before License Termination																					
Period 4d Period-Dependent Costs																					
4d.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4d.4.2	Property taxes	-	-	-	-	-	-	634	63	697	697	-	-	-	-	-	-	-	-	-	-
4d.4.3	Health physics supplies	-	96	-	-	-	-	-	24	120	120	-	-	-	-	-	-	-	-	-	-
4d.4.4	Disposal of DAW generated	-	-	0	0	-	7	-	2	9	9	-	-	-	126	-	-	-	2,529	1	-

Table E-1
Braidwood Nuclear Power Station, 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	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 4d Period-Dependent Costs (continued)																					
4d.4.5	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4d.4.6	NRC Fees	-	-	-	-	-	-	231	23	255	255	-	-	-	-	-	-	-	-	-	-
4d.4.7	Site O&M Costs	-	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-	-	-	-	-
4d.4.8	Utility Staff Cost	-	-	-	-	-	-	1,303	196	1,499	1,499	-	-	-	-	-	-	-	-	-	18,520
4d.4	Subtotal Period 4d Period-Dependent Costs	-	96	0	0	-	7	2,327	332	2,763	2,763	-	-	-	126	-	-	-	2,529	1	18,520
4d.0	TOTAL PERIOD 4d COST	-	96	0	0	-	7	2,327	332	2,763	2,763	-	-	-	126	-	-	-	2,529	1	18,520
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	-	-	-	-	-	-	6,204	1,861	8,065	8,065	-	-	-	-	-	-	-	-	97,350	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	6,204	1,861	8,065	8,065	-	-	-	-	-	-	-	-	97,350	3,120
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	628	-	-	-	-	-	157	785	785	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	19	-	5	25	25	-	-	-	335	-	-	-	6,698	2	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	532	53	585	585	-	-	-	-	-	-	-	-	-	-
4e.4.7	Site O&M Costs	-	-	-	-	-	-	94	14	108	108	-	-	-	-	-	-	-	-	-	-
4e.4.8	Security Staff Cost	-	-	-	-	-	-	527	79	606	606	-	-	-	-	-	-	-	-	-	11,786
4e.4.9	DOC Staff Cost	-	-	-	-	-	-	3,801	570	4,371	4,371	-	-	-	-	-	-	-	-	-	46,750
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	4,551	683	5,234	5,234	-	-	-	-	-	-	-	-	-	56,964
4e.4	Subtotal Period 4e Period-Dependent Costs	-	628	1	0	-	19	10,079	1,628	12,356	12,356	-	-	-	335	-	-	-	6,698	2	115,500
4e.0	TOTAL PERIOD 4e COST	-	628	1	0	-	19	17,564	3,704	21,917	21,917	-	-	-	335	-	-	-	6,698	97,352	118,620
PERIOD 4 TOTALS		3,742	48,736	10,133	7,694	3,938	30,182	120,542	45,663	270,631	260,775	1,018	8,838	216,645	78,773	2,629	470	505	17,054,780	642,370	1,379,149
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	6,763	-	-	-	-	-	1,014	7,778	-	-	7,778	-	-	-	-	-	-	69,546	-
5b.1.1.2	Auxiliary Building	-	5,798	-	-	-	-	-	870	6,667	-	-	6,667	-	-	-	-	-	-	61,037	-
5b.1.1.3	Refueling Water Storage Tank	-	1,028	-	-	-	-	-	154	1,182	-	-	1,182	-	-	-	-	-	-	11,692	-
5b.1.1.4	Steam Generator Storage Facility	-	429	-	-	-	-	-	64	493	-	-	493	-	-	-	-	-	-	4,559	-
5b.1.1.5	Turbine Building	-	5,769	-	-	-	-	-	865	6,634	-	-	6,634	-	-	-	-	-	-	70,342	-
5b.1.1.6	Turbine Pedestal	-	1,352	-	-	-	-	-	203	1,555	-	-	1,555	-	-	-	-	-	-	12,628	-
5b.1.1	Totals	-	21,138	-	-	-	-	-	3,171	24,309	-	-	24,309	-	-	-	-	-	-	229,805	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	716	-	-	-	-	-	107	823	-	-	823	-	-	-	-	-	-	1,942	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	184	28	212	212	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	21,854	-	-	-	-	184	3,306	25,343	212	-	25,132	-	-	-	-	-	-	231,747	1,560

Table E-1
Braidwood Nuclear Power Station, 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	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 5b Additional Costs																					
5b.2.1	ISFSI Demolition and Site Restoration	-	1,303	-	-	-	-	24	199	1,527	-	1,527	-	-	-	-	-	-	-	16,256	80
5b.2.2	Concrete Crushing	-	603	-	-	-	-	3	91	697	-	-	697	-	-	-	-	-	-	2,798	-
5b.2	Subtotal Period 5b Additional Costs	-	1,907	-	-	-	-	27	290	2,224	-	1,527	697	-	-	-	-	-	-	19,053	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	273	-	-	-	-	-	41	315	-	-	315	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	273	-	-	-	-	-	41	315	-	-	315	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,239	124	1,363	-	-	1,363	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,239	-	-	-	-	-	936	7,174	-	-	7,174	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	327	49	376	-	-	376	-	-	-	-	-	-	-	-
5b.4.5	Site O&M Cost	-	-	-	-	-	-	310	46	356	-	-	356	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	1,561	234	1,795	-	-	1,795	-	-	-	-	-	-	-	34,287
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	11,650	1,748	13,398	-	-	13,398	-	-	-	-	-	-	-	137,043
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,559	834	6,392	-	-	6,392	-	-	-	-	-	-	-	67,229
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,239	-	-	-	-	20,645	3,971	30,855	-	-	30,855	-	-	-	-	-	-	-	238,558
5b.0	TOTAL PERIOD 5b COST	-	30,273	-	-	-	-	20,857	7,607	58,737	212	1,527	56,998	-	-	-	-	-	-	250,800	240,198
PERIOD 5 TOTALS		-	30,273	-	-	-	-	20,857	7,607	58,737	212	1,527	56,998	-	-	-	-	-	-	250,800	240,198
TOTAL COST TO DECOMMISSION		9,066	87,270	10,343	8,377	3,938	32,008	516,662	112,329	779,992	598,915	113,746	67,331	216,645	102,379	2,629	470	505	17,618,250	983,920	4,752,062

TOTAL COST TO DECOMMISSION WITH 16.82% CONTINGENCY:	**$779,992**	**thousands of 2009 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 76.78% OR:	**$598,915**	**thousands of 2009 dollars**
SPENT FUEL MANAGEMENT COST IS 14.58% OR:	**$113,746**	**thousands of 2009 dollars**
NON-NUCLEAR DEMOLITION COST IS 8.63% OR:	**$67,331**	**thousands of 2009 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**105,477**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**505**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**57,871**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**983,920**	**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 E-2
Braidwood Nuclear Power Station, 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	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 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	398	119	517	517	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	76	11	87	87	-	-	-	-	-	-	-	-	-	642
1a.1.13	Define major work sequence	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	253	38	290	290	-	-	-	-	-	-	-	-	-	2,140
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	249	37	286	286	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	210	32	242	242	-	-	-	-	-	-	-	-	-	1,783
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	158	24	181	181	-	-	-	-	-	-	-	-	-	1,335
1a.1.16.4	Waste management	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	101	15	116	116	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	819	123	941	941	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	2,211	391	2,602	2,602	-	-	-	-	-	-	-	-	-	15,361
Period 1a Additional Costs																					
1a.2.1	ISFSI Expansion	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	9,900	1,485	11,385	-	11,385	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	8,000	1,200	9,200	-	9,200	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	8,000	1,200	9,200	-	9,200	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	751	75	826	826	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	421	-	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	2	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	471	47	518	518	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	315	32	347	-	347	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	381	57	438	-	438	-	-	-	-	-	-	-	-	-

Table E-2
Braidwood Nuclear Power Station, 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	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 1a Period-Dependent Costs (continued)																					
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	44	7	51	-	51	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	6,337	950	7,287	7,287	-	-	-	-	-	-	-	-	-	157,471
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	31,082	4,662	35,745	35,745	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	842	2	1	-	34	40,825	6,224	47,927	47,092	836	-	-	610	-	-	-	12,190	3	580,871
1a.0	TOTAL PERIOD 1a COST	-	842	2	1	-	34	60,935	9,300	71,114	49,693	21,421	-	-	610	-	-	-	12,190	3	596,232
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	2,135	-	-	-	-	-	-	1,067	3,202	3,202	-	-	-	-	-	-	-	-	33,093	-
1b.1.1.2	Auxiliary Building	246	-	-	-	-	-	-	123	369	369	-	-	-	-	-	-	-	-	3,829	-
1b.1.1.3	Radwaste/Service Building	160	-	-	-	-	-	-	80	240	240	-	-	-	-	-	-	-	-	2,506	-
1b.1.1.4	Refueling Water Storage Tank	351	-	-	-	-	-	-	176	527	527	-	-	-	-	-	-	-	-	5,322	-
1b.1.1.5	Fuel Handling Building	1,003	-	-	-	-	-	-	502	1,505	1,505	-	-	-	-	-	-	-	-	15,238	-
1b.1.1	Totals	3,895	-	-	-	-	-	-	1,947	5,842	5,842	-	-	-	-	-	-	-	-	59,989	-
1b.1	Subtotal Period 1b Activity Costs	3,895	-	-	-	-	-	-	1,947	5,842	5,842	-	-	-	-	-	-	-	-	59,989	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	205	-	90	404	-	389	-	269	1,357	1,357	-	-	-	1,398	-	-	-	83,852	272	-
1b.3.3	Small tool allowance	-	64	-	-	-	-	-	10	73	73	-	-	-	-	-	-	-	-	-	-
1b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,000	300	2,300	-	2,300	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,016	64	90	404	-	389	2,000	701	4,663	2,363	2,300	-	-	1,398	-	-	-	83,852	272	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	746	-	-	-	-	-	-	187	933	933	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	340	-	-	-	-	-	85	425	425	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	2	1	-	33	-	8	43	43	-	-	-	585	-	-	-	11,699	3	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	117	12	129	129	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,580	237	1,817	1,817	-	-	-	-	-	-	-	-	-	39,260
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,749	1,162	8,912	8,912	-	-	-	-	-	-	-	-	-	105,560
1b.4	Subtotal Period 1b Period-Dependent Costs	746	445	2	1	-	33	11,790	1,965	14,982	14,773	208	-	-	585	-	-	-	11,699	3	144,820
1b.0	TOTAL PERIOD 1b COST	5,657	509	92	404	-	422	13,790	4,613	25,486	22,978	2,508	-	-	1,983	-	-	-	95,552	60,264	144,820
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	457	-	-	-	-	-	69	525	525	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	48	-	-	-	-	-	7	55	55	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	13,416	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	29	4	34	34	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	504	-	-	-	-	762	300	1,567	1,567	-	-	-	-	-	-	-	-	17,116	250

Table E-2
Braidwood Nuclear Power Station, 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	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 1c Additional Costs																					
1c.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
1c.2	Subtotal Period 1c Additional Costs	-	-	-	-	-	-	9,690	1,453	11,143	11,143	-	-	-	-	-	-	-	-	-	-
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	251	-	110	494	-	476	-	330	1,661	1,661	-	-	-	1,710	-	-	-	102,618	333	-
1c.3.2	Small tool allowance	-	4	-	-	-	-	-	1	5	5	-	-	-	-	-	-	-	-	-	-
1c.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,000	300	2,300	-	2,300	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	251	4	110	494	-	476	2,000	630	3,966	1,666	2,300	-	-	1,710	-	-	-	102,618	333	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	187	19	206	206	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	1,612	161	1,773	1,773	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	145	-	-	-	-	-	36	182	182	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	105	-	-	-	-	-	16	121	121	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	6	-	1	8	8	-	-	-	102	-	-	-	2,045	0	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	329	49	378	378	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	117	12	129	129	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	79	8	86	-	86	-	-	-	-	-	-	-	-	-
1c.4.9	Site O&M Costs	-	-	-	-	-	-	31	5	36	36	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	95	14	109	-	109	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	11	2	13	-	13	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,580	237	1,817	1,817	-	-	-	-	-	-	-	-	-	39,260
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	1,559	234	1,793	1,793	-	-	-	-	-	-	-	-	-	19,500
1c.4	Subtotal Period 1c Period-Dependent Costs	-	250	0	0	-	6	5,600	794	6,650	6,442	208	-	-	102	-	-	-	2,045	0	58,760
1c.0	TOTAL PERIOD 1c COST	251	759	110	494	-	482	18,052	3,178	23,326	20,818	2,508	-	-	1,813	-	-	-	104,664	17,450	59,010
PERIOD 1 TOTALS		5,908	2,110	204	899	-	938	92,778	17,090	119,927	93,489	26,437	-	-	4,405	-	-	-	212,406	77,716	800,062
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	-	-	-	-	-	-	241	36	277	277	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	503	126	629	629	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	744	162	906	906	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	34,000	5,100	39,100	-	39,100	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	34,000	5,100	39,100	-	39,100	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,345	134	1,479	1,296	184	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	7,726	773	8,499	2,200	6,299	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	336	-	-	-	-	-	84	419	419	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	5	2	-	87	-	22	115	115	-	-	-	1,551	-	-	-	31,027	7	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,056	158	1,214	607	607	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	715	72	787	787	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	400	40	440	-	440	-	-	-	-	-	-	-	-	-
2a.4.8	Site O&M Costs	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	2,294	344	2,639	-	2,639	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	176	26	202	-	202	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	10,406	1,561	11,967	3,462	8,505	-	-	-	-	-	-	-	-	287,274
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	12,191	1,829	14,019	4,281	9,738	-	-	-	-	-	-	-	-	156,452
2a.4	Subtotal Period 2a Period-Dependent Costs	-	336	5	2	-	87	36,809	5,118	42,356	13,743	28,613	-	-	1,551	-	-	-	31,027	7	443,727

Table E-2
Braidwood Nuclear Power Station, 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	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
2a.0	TOTAL PERIOD 2a COST	-	336	5	2	-	87	71,553	10,380	82,362	14,649	67,713	-	-	1,551	-	-	-	31,027	7	443,727
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	-	-	-	-	-	-	755	113	869	869	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	1,577	394	1,972	1,972	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	2,333	508	2,840	2,840	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,375	1,106	8,481	-	8,481	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	7,375	1,106	8,481	-	8,481	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	3,813	381	4,195	4,062	133	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	6,270	627	6,897	6,897	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	978	-	-	-	-	-	245	1,223	1,223	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	14	5	-	264	-	68	351	351	-	-	-	4,731	-	-	-	94,623	22	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	1,655	248	1,903	1,903	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	2,243	224	2,467	2,467	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,254	125	1,379	-	1,379	-	-	-	-	-	-	-	-	-
2b.4.8	Site O&M Costs	-	-	-	-	-	-	1,567	235	1,803	1,803	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	551	83	634	-	634	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	14,290	2,144	16,434	10,853	5,581	-	-	-	-	-	-	-	-	323,217
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	19,012	2,852	21,863	13,420	8,443	-	-	-	-	-	-	-	-	261,714
2b.4	Subtotal Period 2b Period-Dependent Costs	-	978	14	5	-	264	50,656	7,232	59,149	42,979	16,170	-	-	4,731	-	-	-	94,623	22	584,931
2b.0	TOTAL PERIOD 2b COST	-	978	14	5	-	264	60,364	8,846	70,471	45,819	24,652	-	-	4,731	-	-	-	94,623	22	584,931
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	2,079	312	2,391	2,391	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	4,342	1,085	5,427	5,427	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	6,421	1,397	7,819	7,819	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	10,165	1,017	11,182	11,182	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	17,260	1,726	18,986	18,986	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,608	-	-	-	-	-	652	3,259	3,259	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	38	14	-	718	-	185	956	956	-	-	-	12,871	-	-	-	257,419	59	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	4,556	683	5,240	5,240	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	5,892	589	6,482	6,482	-	-	-	-	-	-	-	-	-	-
2c.4.7	Site O&M Costs	-	-	-	-	-	-	4,315	647	4,962	4,962	-	-	-	-	-	-	-	-	-	-
2c.4.8	Security Staff Cost	-	-	-	-	-	-	25,980	3,897	29,877	29,877	-	-	-	-	-	-	-	-	-	528,095
2c.4.9	Utility Staff Cost	-	-	-	-	-	-	32,125	4,819	36,944	36,944	-	-	-	-	-	-	-	-	-	455,329
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,608	38	14	-	718	100,294	14,216	117,887	117,887	-	-	-	12,871	-	-	-	257,419	59	983,424
2c.0	TOTAL PERIOD 2c COST	-	2,608	38	14	-	718	106,715	15,613	125,706	125,706	-	-	-	12,871	-	-	-	257,419	59	983,424
PERIOD 2 TOTALS		-	3,921	56	21	-	1,069	238,632	34,839	278,539	186,174	92,365	-	-	19,153	-	-	-	383,069	88	2,012,082

Table E-2
Braidwood Nuclear Power Station, 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	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 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	379	57	436	436	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	157	23	180	180	-	-	-	-	-	-	-	-	-	1,327
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	253	38	290	290	-	-	-	-	-	-	-	-	-	2,140
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	207	31	238	238	-	-	-	-	-	-	-	-	-	1,753
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	372	56	428	385	-	43	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	210	32	242	218	-	24	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	359	54	412	412	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	328	49	378	378	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	25	4	29	29	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	158	24	181	181	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	81	12	93	46	-	46	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	158	24	181	91	-	91	-	-	-	-	-	-	-	1,335
3a.1.11.11	Waste management	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	45	7	52	26	-	26	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	2,009	301	2,310	2,034	-	277	-	-	-	-	-	-	-	17,024
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	121	18	139	139	-	-	-	-	-	-	-	-	-	1,027
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,200	330	2,530	2,530	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	62	9	71	71	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	8,672	1,301	9,973	9,696	-	277	-	-	-	-	-	-	-	31,117
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	294	29	324	324	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	500	50	550	550	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	349	-	-	-	-	-	87	437	437	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	421	-	-	-	-	-	63	484	484	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	1	1	-	27	-	7	36	36	-	-	-	481	-	-	-	9,613	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,319	198	1,517	1,517	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	214	21	236	236	-	-	-	-	-	-	-	-	-	-
3a.4.8	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	238	36	274	274	-	-	-	-	-	-	-	-	-	6,257
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	14,259	2,139	16,398	16,398	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	770	1	1	-	27	16,950	2,649	20,398	20,398	-	-	-	481	-	-	-	9,613	2	206,486
3a.0	TOTAL PERIOD 3a COST	-	770	1	1	-	27	25,622	3,950	30,371	30,094	-	277	-	481	-	-	-	9,613	2	237,603

Table E-2
Braidwood Nuclear Power Station, 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	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 - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	239	36	275	247	-	27	-	-	-	-	-	-	-	2,026
3b.1.1.2	Reactor internals	-	-	-	-	-	-	126	19	145	145	-	-	-	-	-	-	-	-	-	1,070
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	68	10	78	20	-	59	-	-	-	-	-	-	-	578
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	183	28	211	211	-	-	-	-	-	-	-	-	-	1,554
3b.1.1.8	Facility closeout	-	-	-	-	-	-	61	9	70	35	-	35	-	-	-	-	-	-	-	514
3b.1.1.9	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	193
3b.1.1.10	Biological shield	-	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-	-	-	-	514
3b.1.1.11	Steam generators	-	-	-	-	-	-	232	35	267	267	-	-	-	-	-	-	-	-	-	1,969
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	51	8	58	29	-	29	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	79	12	91	-	-	91	-	-	-	-	-	-	-	668
3b.1.1.14	Main Condensers	-	-	-	-	-	-	79	12	91	-	-	91	-	-	-	-	-	-	-	668
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	138	21	159	143	-	16	-	-	-	-	-	-	-	1,168
3b.1.1.16	Reactor building	-	-	-	-	-	-	138	21	159	143	-	16	-	-	-	-	-	-	-	1,168
3b.1.1	Total	-	-	-	-	-	-	1,629	244	1,873	1,510	-	363	-	-	-	-	-	-	-	13,800
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,629	244	1,873	1,510	-	363	-	-	-	-	-	-	-	13,800
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	2,657	797	3,454	3,454	-	-	-	-	-	-	-	-	12,779	4,547
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	2,657	797	3,454	3,454	-	-	-	-	-	-	-	-	12,779	4,547
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	811	-	-	-	-	-	-	122	932	932	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,100	-	-	-	-	-	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	811	1,100	-	-	-	-	1,130	456	3,497	3,497	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	25	-	-	-	-	-	-	6	31	31	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	169	17	186	186	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	252	25	277	277	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	190	-	-	-	-	-	48	238	238	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	212	-	-	-	-	-	32	244	244	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	1	0	-	15	-	4	20	20	-	-	-	267	-	-	-	5,344	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	665	100	765	765	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	108	11	119	119	-	-	-	-	-	-	-	-	-	-
3b.4.9	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	120	18	138	138	-	-	-	-	-	-	-	-	-	3,154
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	3,314	497	3,811	3,811	-	-	-	-	-	-	-	-	-	43,109
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	7,188	1,078	8,267	8,267	-	-	-	-	-	-	-	-	-	100,937
3b.4	Subtotal Period 3b Period-Dependent Costs	25	402	1	0	-	15	11,879	1,845	14,167	14,167	-	-	-	267	-	-	-	5,344	1	147,200
3b.0	TOTAL PERIOD 3b COST	836	1,502	1	0	-	15	17,295	3,342	22,990	22,627	-	363	-	267	-	-	-	5,344	12,780	165,547
PERIOD 3 TOTALS		836	2,272	2	1	-	42	42,916	7,292	53,361	52,721	-	640	-	748	-	-	-	14,956	12,782	403,149

Table E-2
Braidwood Nuclear Power Station, 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	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 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	46	160	33	21	45	170	-	119	594	594	-	-	864	864	-	-	-	200,408	3,290	-
4a.1.1.2	Pressurizer Relief Tank	8	29	6	4	9	30	-	21	107	107	-	-	165	165	-	-	-	36,553	596	-
4a.1.1.3	Reactor Coolant Pumps & Motors	28	105	57	168	-	1,272	-	389	2,018	2,018	-	-	-	4,796	-	-	-	780,540	2,726	80
4a.1.1.4	Pressurizer	12	68	347	94	-	412	-	175	1,108	1,108	-	-	-	3,033	-	-	-	252,826	1,527	750
4a.1.1.5	Steam Generators	94	4,168	1,486	2,392	580	3,416	-	2,537	14,674	14,674	-	-	39,289	14,436	-	-	-	3,096,232	20,508	1,500
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	22	80	176	31	-	59	-	68	436	436	-	-	-	2,843	-	-	-	50,181	1,648	-
4a.1.1.7	Reactor Vessel Internals	75	2,001	3,442	525	-	3,717	203	4,419	14,383	14,383	-	-	-	2,211	376	470	-	325,254	23,067	1,055
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	11,837	-	1,776	13,613	13,613	-	-	-	-	-	-	505	104,146	-	-
4a.1.1.9	Reactor Vessel	90	3,970	1,283	670	-	2,978	203	5,030	14,224	14,224	-	-	-	6,672	2,254	-	-	979,179	23,067	1,055
4a.1.1	Totals	374	10,580	6,831	3,905	634	23,892	406	14,534	61,156	61,156	-	-	40,318	35,019	2,629	470	505	5,825,319	76,428	4,439
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	574	262	32	214	-	-	207	1,288	1,288	-	-	5,355	-	-	-	-	455,213	9,016	-
4a.1.3	Main Condensers	-	1,176	136	27	150	-	-	334	1,823	1,823	-	-	7,111	-	-	-	-	320,000	18,250	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,171	-	-	-	-	-	176	1,346	1,346	-	-	-	-	-	-	-	-	12,130	-
4a.1.4.2	Auxiliary Building	-	655	-	-	-	-	-	98	754	754	-	-	-	-	-	-	-	-	6,896	-
4a.1.4.3	Radwaste/Service Building	-	429	-	-	-	-	-	64	494	494	-	-	-	-	-	-	-	-	5,059	-
4a.1.4.4	Refueling Water Storage Tank	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,299	-
4a.1.4.5	Fuel Handling Building	-	337	-	-	-	-	-	51	388	388	-	-	-	-	-	-	-	-	3,690	-
4a.1.4	Totals	-	2,707	-	-	-	-	-	406	3,113	3,113	-	-	-	-	-	-	-	-	29,074	-
Disposal of Plant Systems																					
4a.1.5.1	Auxiliary Feedwater	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,143	-
4a.1.5.2	Auxiliary Steam	-	130	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,107	-
4a.1.5.3	Auxiliary Steam RCA	-	357	5	9	54	-	-	99	525	525	-	-	2,822	-	-	-	-	114,583	5,241	-
4a.1.5.4	Boric Acid Processing	-	463	28	23	34	106	-	154	808	808	-	-	1,794	1,076	-	-	-	162,827	6,970	-
4a.1.5.5	CO2 & H2	-	18	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	289	-
4a.1.5.6	CO2 & H2 RCA	-	34	1	1	5	-	-	9	50	50	-	-	287	-	-	-	-	11,664	478	-
4a.1.5.7	Chemical Feed	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	2,663	-
4a.1.5.8	Chemical Feed at Intake	-	23	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	364	-
4a.1.5.9	Chilled Water	-	91	-	-	-	-	-	14	104	-	-	104	-	-	-	-	-	-	1,454	-
4a.1.5.10	Circulating Water	-	542	-	-	-	-	-	81	624	-	-	624	-	-	-	-	-	-	8,814	-
4a.1.5.11	Condensate	-	333	-	-	-	-	-	50	383	-	-	383	-	-	-	-	-	-	5,317	-
4a.1.5.12	Condensate Booster	-	332	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	5,314	-
4a.1.5.13	Condensate Cleanup	-	182	-	-	-	-	-	27	209	-	-	209	-	-	-	-	-	-	3,000	-
4a.1.5.14	Containment Spray	-	251	7	12	69	-	-	76	414	414	-	-	3,602	-	-	-	-	146,289	3,673	-
4a.1.5.15	Diesel Fuel Oil	-	180	-	-	-	-	-	27	207	-	-	207	-	-	-	-	-	-	2,848	-
4a.1.5.16	Essential Service Water	-	311	-	-	-	-	-	47	358	-	-	358	-	-	-	-	-	-	5,049	-
4a.1.5.17	Extraction Steam	-	223	-	-	-	-	-	33	256	-	-	256	-	-	-	-	-	-	3,637	-
4a.1.5.18	Feedwater	-	303	-	-	-	-	-	45	348	-	-	348	-	-	-	-	-	-	4,925	-
4a.1.5.19	Feedwater Drains	-	719	-	-	-	-	-	108	827	-	-	827	-	-	-	-	-	-	11,719	-
4a.1.5.20	Gland Steam	-	38	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	616	-
4a.1.5.21	Gland Water	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	458	-
4a.1.5.22	Main Steam	-	308	-	-	-	-	-	46	354	-	-	354	-	-	-	-	-	-	4,979	-
4a.1.5.23	Main Steam RCA	-	84	2	3	19	-	-	24	132	132	-	-	990	-	-	-	-	40,190	1,250	-
4a.1.5.24	Make-up Demineralizer	-	155	-	-	-	-	-	23	179	-	-	179	-	-	-	-	-	-	2,595	-
4a.1.5.25	Nitrogen	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	18	-
4a.1.5.26	Non-Essential Service Water	-	361	-	-	-	-	-	54	416	-	-	416	-	-	-	-	-	-	5,903	-
4a.1.5.27	Non-Essential Service Water RCA	-	179	7	13	75	-	-	59	332	332	-	-	3,909	-	-	-	-	158,755	2,535	-
4a.1.5.28	Off Gas	-	665	13	25	141	-	-	192	1,037	1,037	-	-	7,411	-	-	-	-	300,945	10,038	-
4a.1.5.29	Potable Water	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	75	-
4a.1.5.30	Process Radiation Monitoring	-	64	0	0	3	-	-	17	84	84	-	-	138	-	-	-	-	5,613	1,086	-

Table E-2
Braidwood Nuclear Power Station, 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	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
Disposal of Plant Systems (continued)																					
4a.1.5.31	Process Sampling	-	143	1	2	12	-	-	38	196	196	-	-	641	-	-	-	-	26,045	2,347	-
4a.1.5.32	Screen Wash	-	45	-	-	-	-	-	7	52	-	-	52	-	-	-	-	-	-	740	-
4a.1.5.33	Station Air	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	705	-
4a.1.5.34	Station Heating	-	147	-	-	-	-	-	22	169	-	-	169	-	-	-	-	-	-	2,391	-
4a.1.5.35	Steam Humidification	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	115	-
4a.1.5.36	Switchgear Heat Removal	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	519	-
4a.1.5.37	Turbine Bldg Equip Drains	-	76	-	-	-	-	-	11	88	-	-	88	-	-	-	-	-	-	1,235	-
4a.1.5.38	Turbine Bldg Floor Drains	-	131	-	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	2,117	-
4a.1.5.39	Turbine Oil	-	83	-	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	1,359	-
4a.1.5.40	Turbine-Generator Auxilaries	-	56	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	884	-
4a.1.5.41	Waste Oil Sumps	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	517	-
4a.1.5.42	Well Water	-	79	-	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,247	-
4a.1.5	Totals	-	7,489	64	90	412	106	-	1,455	9,616	3,579	-	6,037	21,594	1,076	-	-	-	966,911	118,732	-
4a.1.6	Scaffolding in support of decommissioning	-	1,560	10	2	10	3	-	394	1,979	1,979	-	-	473	29	-	-	-	23,936	26,661	-
4a.1	Subtotal Period 4a Activity Costs	374	24,085	7,303	4,055	1,420	24,001	406	17,329	78,975	72,938	-	6,037	74,851	36,125	2,629	470	505	7,591,379	278,163	4,439
Period 4a Collateral Costs																					
4a.3.1	Process liquid waste	36	-	18	82	-	79	-	52	266	266	-	-	-	283	-	-	-	16,991	55	-
4a.3.2	Small tool allowance	-	280	-	-	-	-	-	42	322	290	-	32	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	36	280	18	82	-	79	-	94	589	556	-	32	-	283	-	-	-	16,991	55	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	65	-	-	-	-	-	-	16	81	81	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	442	44	486	486	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	657	66	723	651	-	72	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,629	-	-	-	-	-	407	2,036	2,036	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,333	-	-	-	-	-	350	2,683	2,683	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	9	3	-	175	-	45	233	233	-	-	-	3,142	-	-	-	62,838	14	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,648	247	1,895	1,895	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	593	59	652	652	-	-	-	-	-	-	-	-	-	-
4a.4.9	Site O&M Costs	-	-	-	-	-	-	164	25	189	189	-	-	-	-	-	-	-	-	-	-
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	504	76	579	579	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	2,532	380	2,912	2,912	-	-	-	-	-	-	-	-	-	66,597
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,980	2,247	17,227	17,227	-	-	-	-	-	-	-	-	-	187,776
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	24,577	3,687	28,264	28,264	-	-	-	-	-	-	-	-	-	333,202
4a.4	Subtotal Period 4a Period-Dependent Costs	65	3,962	9	3	-	175	46,097	7,649	57,960	57,888	-	72	-	3,142	-	-	-	62,838	14	587,575
4a.0	TOTAL PERIOD 4a COST	475	28,327	7,331	4,140	1,420	24,256	46,503	25,072	137,524	131,382	-	6,142	74,851	39,550	2,629	470	505	7,671,209	278,232	592,014
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	1,093	118	313	95	-	590	-	769	2,978	2,978	-	-	-	5,572	-	-	-	499,920	2,174	-
Disposal of Plant Systems																					
4b.1.2.1	Chemical & Volume Control	-	1,046	60	45	34	243	-	340	1,769	1,769	-	-	1,783	2,322	-	-	-	278,742	15,645	-
4b.1.2.2	Chilled Water RCA	-	647	13	25	139	-	-	188	1,012	1,012	-	-	7,293	-	-	-	-	296,176	9,173	-
4b.1.2.3	Component Cooling	-	687	17	31	178	-	-	205	1,118	1,118	-	-	9,319	-	-	-	-	378,439	10,075	-
4b.1.2.4	Electrical	-	4,168	-	-	-	-	-	625	4,793	-	-	4,793	-	-	-	-	-	-	66,259	-
4b.1.2.5	Electrical - Contaminated	-	1,716	17	32	181	-	-	463	2,409	2,409	-	-	9,508	-	-	-	-	386,137	25,754	-
4b.1.2.6	Electrical - RCA	-	2,460	39	72	410	-	-	691	3,673	3,673	-	-	21,460	-	-	-	-	871,483	37,551	-
4b.1.2.7	Emergency Diesel Generator	-	95	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	1,514	-
4b.1.2.8	Essential Service Water RCA	-	333	17	32	179	-	-	117	677	677	-	-	9,380	-	-	-	-	380,930	4,955	-
4b.1.2.9	Fire Protection	-	307	-	-	-	-	-	46	353	-	-	353	-	-	-	-	-	-	4,983	-
4b.1.2.10	Fire Protection RCA	-	521	12	22	124	-	-	153	832	832	-	-	6,516	-	-	-	-	264,606	7,384	-
4b.1.2.11	Fuel Handling Bldg Equip Drains	-	161	7	7	20	23	-	51	268	268	-	-	1,027	221	-	-	-	60,829	2,404	-

Table E-2
Braidwood Nuclear Power Station, 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	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
Disposal of Plant Systems (continued)																					
4b.1.2.12	Fuel Handling Bldg Equip Drains (Unit 1)	-	29	1	1	1	4	-	8	44	44	-	-	67	34	-	-	-	5,758	424	-
4b.1.2.13	Fuel Handling Bldg Floor Drains	-	164	7	7	16	25	-	51	270	270	-	-	830	238	-	-	-	54,723	2,441	-
4b.1.2.14	Fuel Handling Bldg Floor Drains (Unit 1)	-	114	4	4	13	11	-	34	181	181	-	-	703	109	-	-	-	37,980	1,740	-
4b.1.2.15	Fuel Pool Cooling & Cleanup	-	218	11	11	24	43	-	72	380	380	-	-	1,275	406	-	-	-	88,160	3,272	-
4b.1.2.16	Fuel Pool Cooling & Cleanup (Unit 1)	-	202	10	10	23	38	-	66	350	350	-	-	1,226	361	-	-	-	82,110	3,050	-
4b.1.2.17	HVAC-Auxiliary Building	-	529	10	19	108	-	-	152	818	818	-	-	5,643	-	-	-	-	229,172	7,876	-
4b.1.2.18	HVAC-Control Room HVAC	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	127	-
4b.1.2.19	HVAC-Diesel Generator Room	-	43	-	-	-	-	-	6	50	-	-	50	-	-	-	-	-	-	686	-
4b.1.2.20	HVAC-Laboratory	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	315	-
4b.1.2.21	HVAC-Machine Shop	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	297	-
4b.1.2.22	HVAC-Miscellaneous	-	110	-	-	-	-	-	17	127	-	-	127	-	-	-	-	-	-	1,769	-
4b.1.2.23	HVAC-Primary Containment	-	588	19	36	204	-	-	185	1,032	1,032	-	-	10,679	-	-	-	-	433,695	8,624	-
4b.1.2.24	HVAC-Pumphouse	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	275	-
4b.1.2.25	HVAC-Radwaste	-	303	6	11	63	-	-	87	471	471	-	-	3,327	-	-	-	-	135,102	4,323	-
4b.1.2.26	HVAC-Turbine Building	-	186	-	-	-	-	-	28	214	-	-	214	-	-	-	-	-	-	3,158	-
4b.1.2.27	Instrument Air Supply	-	72	-	-	-	-	-	11	83	-	-	83	-	-	-	-	-	-	1,197	-
4b.1.2.28	Instrument Air Supply RCA	-	240	2	3	20	-	-	64	329	329	-	-	1,035	-	-	-	-	42,036	3,563	-
4b.1.2.29	Miscellaneous Drains	-	73	1	2	12	-	-	20	108	108	-	-	617	-	-	-	-	25,043	1,104	-
4b.1.2.30	Primary Containment Purge	-	289	10	20	111	-	-	93	523	523	-	-	5,816	-	-	-	-	236,197	4,524	-
4b.1.2.31	Primary Water	-	801	32	43	187	61	-	253	1,377	1,377	-	-	9,803	667	-	-	-	449,848	12,651	-
4b.1.2.32	Radioactive Waste Disposal	-	2,694	170	139	187	658	-	904	4,752	4,752	-	-	9,780	6,604	-	-	-	954,524	40,174	-
4b.1.2.33	Reactor Bldg Equipment Drains	-	106	8	7	7	37	-	39	203	203	-	-	356	350	-	-	-	45,614	1,581	-
4b.1.2.34	Reactor Building Floor Drains	-	40	2	2	2	7	-	12	65	65	-	-	125	66	-	-	-	11,009	597	-
4b.1.2.35	Reactor Coolant	-	161	8	6	4	32	-	50	260	260	-	-	206	299	-	-	-	35,137	2,391	-
4b.1.2.36	Residual Heat Removal	-	184	11	12	27	43	-	64	340	340	-	-	1,421	405	-	-	-	94,061	2,834	-
4b.1.2.37	Safety Injection	-	841	37	46	172	98	-	271	1,465	1,465	-	-	9,001	979	-	-	-	448,431	13,165	-
4b.1.2.38	Station Air RCA	-	56	1	1	6	-	-	15	78	78	-	-	293	-	-	-	-	11,919	815	-
4b.1.2.39	Station Heating RCA	-	244	4	8	46	-	-	70	373	373	-	-	2,412	-	-	-	-	97,961	3,548	-
4b.1.2.40	Tritium ALPS	-	364	9	17	99	-	-	109	599	599	-	-	5,181	-	-	-	-	210,418	5,732	-
4b.1.2.41	Waste Oil Sumps RCA	-	25	0	1	3	-	-	7	36	36	-	-	154	-	-	-	-	6,246	361	-
4b.1.2.42	Waste Water Treatment	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	1,464	-
4b.1.2	Totals	-	20,969	549	672	2,600	1,321	-	5,605	31,717	25,813	-	5,903	136,237	13,061	-	-	-	6,652,483	319,776	-
4b.1.3	Scaffolding in support of decommissioning	-	2,340	15	3	15	5	-	590	2,968	2,968	-	-	710	44	-	-	-	35,904	39,992	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	1,937	1,369	176	195	134	455	-	1,491	5,757	5,757	-	-	7,022	8,433	-	-	-	1,122,380	50,350	-
4b.1.4.2	Auxiliary Building	227	116	8	9	17	18	-	151	545	545	-	-	866	322	-	-	-	66,370	5,240	-
4b.1.4.3	Radwaste/Service Building	149	46	6	7	6	15	-	92	320	320	-	-	322	278	-	-	-	40,039	2,959	-
4b.1.4.4	Refueling Water Storage Tank	352	408	4	5	22	6	-	284	1,081	1,081	-	-	1,146	87	-	-	-	54,852	11,906	-
4b.1.4.5	Fuel Handling Building	1,009	1,121	14	17	59	26	-	804	3,051	3,051	-	-	3,097	411	-	-	-	165,831	33,340	-
4b.1.4	Totals	3,673	3,060	208	233	238	520	-	2,823	10,754	10,754	-	-	12,452	9,531	-	-	-	1,449,473	103,795	-
4b.1	Subtotal Period 4b Activity Costs	4,766	26,487	1,084	1,004	2,853	2,436	-	9,787	48,417	42,514	-	5,903	149,399	28,207	-	-	-	8,637,780	465,737	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	940	282	1,222	1,222	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	ISFSI License Termination	-	41	1	24	-	90	719	144	1,018	-	1,018	-	-	1,703	-	-	-	142,573	2,775	1,280
4b.2	Subtotal Period 4b Additional Costs	-	41	1	24	-	90	1,659	426	2,240	1,222	1,018	-	-	1,703	-	-	-	142,573	2,775	7,520
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	103	-	53	237	-	228	-	149	770	770	-	-	-	820	-	-	-	49,217	160	-
4b.3.2	Small tool allowance	-	497	-	-	-	-	-	74	571	571	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	123	34	127	40	-	46	369	369	-	-	6,000	373	-	-	-	303,507	88	-
4b.3	Subtotal Period 4b Collateral Costs	103	497	175	271	127	268	-	270	1,710	1,710	-	-	6,000	1,194	-	-	-	352,724	248	-

Table E-2
Braidwood Nuclear Power Station, 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	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 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	868	-	-	-	-	-	-	217	1,085	1,085	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	909	91	999	999	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	1,351	135	1,486	1,486	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,937	-	-	-	-	-	734	3,671	3,671	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,759	-	-	-	-	-	714	5,472	5,472	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	20	7	-	374	-	97	498	498	-	-	-	6,704	-	-	-	134,081	31	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,675	401	3,076	3,076	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,219	122	1,340	1,340	-	-	-	-	-	-	-	-	-	-
4b.4.9	Site O&M Costs	-	-	-	-	-	-	338	51	388	388	-	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,036	155	1,191	1,191	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	7,645	1,147	8,792	8,792	-	-	-	-	-	-	-	-	-	176,250
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	30,407	4,561	34,967	34,967	-	-	-	-	-	-	-	-	-	377,880
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	50,045	7,507	57,552	57,552	-	-	-	-	-	-	-	-	-	665,520
4b.4	Subtotal Period 4b Period-Dependent Costs	868	7,695	20	7	-	374	95,624	15,931	120,519	120,519	-	-	-	6,704	-	-	-	134,081	31	1,219,650
4b.0	TOTAL PERIOD 4b COST	5,736	34,720	1,280	1,306	2,980	3,167	97,283	26,414	172,886	165,965	1,018	5,903	155,399	37,808	-	-	-	9,267,158	468,791	1,227,170
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	-	-	-	-	-	-	8,222	2,467	10,688	10,688	-	-	-	-	-	-	-	-	131,983	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	8,222	2,467	10,688	10,688	-	-	-	-	-	-	-	-	131,983	3,120
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,130	169	1,299	1,299	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	376	38	414	414	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	763	-	-	-	-	-	191	954	954	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	0	-	19	-	5	25	25	-	-	-	335	-	-	-	6,698	2	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	199	30	229	229	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	355	35	390	390	-	-	-	-	-	-	-	-	-	-
4e.4.7	Site O&M Costs	-	-	-	-	-	-	94	14	108	108	-	-	-	-	-	-	-	-	-	-
4e.4.8	Security Staff Cost	-	-	-	-	-	-	527	79	606	606	-	-	-	-	-	-	-	-	-	11,786
4e.4.9	DOC Staff Cost	-	-	-	-	-	-	3,801	570	4,371	4,371	-	-	-	-	-	-	-	-	-	46,750
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	4,551	683	5,234	5,234	-	-	-	-	-	-	-	-	-	56,964
4e.4	Subtotal Period 4e Period-Dependent Costs	-	763	1	0	-	19	9,902	1,644	12,330	12,330	-	-	-	335	-	-	-	6,698	2	115,500
4e.0	TOTAL PERIOD 4e COST	-	763	1	0	-	19	19,406	4,326	24,515	24,515	-	-	-	335	-	-	-	6,698	131,985	118,620
PERIOD 4 TOTALS		6,211	63,810	8,612	5,446	4,400	27,442	163,192	55,812	334,925	321,862	1,018	12,045	230,250	77,693	2,629	470	505	16,945,060	879,008	1,937,804
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	6,763	-	-	-	-	-	1,014	7,778	-	-	7,778	-	-	-	-	-	-	69,546	-
5b.1.1.2	Aux Feedwater-Steam Tunnel/Penetr. Area	-	689	-	-	-	-	-	103	792	-	-	792	-	-	-	-	-	-	5,186	-
5b.1.1.3	Auxiliary Building	-	5,899	-	-	-	-	-	885	6,784	-	-	6,784	-	-	-	-	-	-	62,063	-
5b.1.1.4	Blowdown Outfall Structure	-	29	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	295	-

Table E-2
Braidwood Nuclear Power Station, 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	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
Demolition of Remaining Site Buildings (continued)																					
5b.1.1.5	Bottled Gas Storage	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	340	-
5b.1.1.6	Circulating Water Discharge	-	233	-	-	-	-	-	35	268	-	-	268	-	-	-	-	-	-	2,887	-
5b.1.1.7	Gatehouse and Extension	-	333	-	-	-	-	-	50	382	-	-	382	-	-	-	-	-	-	4,193	-
5b.1.1.8	Instrument Maintenance Building	-	94	-	-	-	-	-	14	109	-	-	109	-	-	-	-	-	-	1,190	-
5b.1.1.9	Lake Screen House	-	1,494	-	-	-	-	-	224	1,718	-	-	1,718	-	-	-	-	-	-	15,283	-
5b.1.1.10	Make-up Demineralizer Area	-	647	-	-	-	-	-	97	744	-	-	744	-	-	-	-	-	-	8,158	-
5b.1.1.11	Miscellaneous Warehouses	-	1,991	-	-	-	-	-	299	2,290	-	-	2,290	-	-	-	-	-	-	26,794	-
5b.1.1.12	Miscellaneous Yard Structures	-	1,254	-	-	-	-	-	188	1,442	-	-	1,442	-	-	-	-	-	-	14,693	-
5b.1.1.13	Radwaste/Service Building	-	3,927	-	-	-	-	-	589	4,516	-	-	4,516	-	-	-	-	-	-	45,685	-
5b.1.1.14	Receiving Building	-	183	-	-	-	-	-	27	210	-	-	210	-	-	-	-	-	-	2,292	-
5b.1.1.15	Refueling Water Storage Tank	-	1,028	-	-	-	-	-	154	1,182	-	-	1,182	-	-	-	-	-	-	11,692	-
5b.1.1.16	River Screen House	-	616	-	-	-	-	-	92	708	-	-	708	-	-	-	-	-	-	6,844	-
5b.1.1.17	Security Modifications	-	959	-	-	-	-	-	144	1,103	-	-	1,103	-	-	-	-	-	-	6,939	-
5b.1.1.18	Sewage Treatment Plant	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	1,326	-
5b.1.1.19	Tech Support Center & Cond Cleanup Bldg	-	499	-	-	-	-	-	75	574	-	-	574	-	-	-	-	-	-	6,095	-
5b.1.1.20	Turbine Building	-	5,769	-	-	-	-	-	865	6,634	-	-	6,634	-	-	-	-	-	-	70,342	-
5b.1.1.21	Turbine Pedestal	-	1,352	-	-	-	-	-	203	1,555	-	-	1,555	-	-	-	-	-	-	12,628	-
5b.1.1.22	Waste Treatment Building	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	1,265	-
5b.1.1.23	Fuel Handling Building	-	3,039	-	-	-	-	-	456	3,495	-	-	3,495	-	-	-	-	-	-	33,245	-
5b.1.1	Totals	-	37,032	-	-	-	-	-	5,555	42,587	-	-	42,587	-	-	-	-	-	-	408,981	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	237	-	-	-	-	-	35	272	-	-	272	-	-	-	-	-	-	1,367	-
5b.1.3	Grade & landscape site	-	716	-	-	-	-	-	107	823	-	-	823	-	-	-	-	-	-	1,942	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	79	12	91	91	-	-	-	-	-	-	-	-	-	668
5b.1	Subtotal Period 5b Activity Costs	-	37,984	-	-	-	-	79	5,709	43,772	91	-	43,681	-	-	-	-	-	-	412,290	668
Period 5b Additional Costs																					
5b.2.1	ISFSI Demolition and Site Restoration	-	1,303	-	-	-	-	24	199	1,527	-	1,527	-	-	-	-	-	-	-	16,256	80
5b.2.2	Cofferdam Construction and Teardown	-	778	-	-	-	-	-	117	894	-	-	894	-	-	-	-	-	-	7,391	-
5b.2.3	Concrete Crushing	-	1,020	-	-	-	-	5	154	1,179	-	-	1,179	-	-	-	-	-	-	4,730	-
5b.2	Subtotal Period 5b Additional Costs	-	3,101	-	-	-	-	29	470	3,600	-	1,527	2,074	-	-	-	-	-	-	28,377	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	477	-	-	-	-	-	71	548	-	-	548	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	477	-	-	-	-	-	71	548	-	-	548	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,239	124	1,363	-	-	1,363	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,239	-	-	-	-	-	936	7,174	-	-	7,174	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	327	49	376	-	-	376	-	-	-	-	-	-	-	-
5b.4.5	Site O&M Cost	-	-	-	-	-	-	310	46	356	-	-	356	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	1,561	234	1,795	-	-	1,795	-	-	-	-	-	-	-	34,287
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	11,650	1,748	13,398	-	-	13,398	-	-	-	-	-	-	-	137,043
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,559	834	6,392	-	-	6,392	-	-	-	-	-	-	-	67,229
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,239	-	-	-	-	20,645	3,971	30,855	-	-	30,855	-	-	-	-	-	-	-	238,558
5b.0	TOTAL PERIOD 5b COST	-	47,800	-	-	-	-	20,753	10,221	78,775	91	1,527	77,158	-	-	-	-	-	-	440,667	239,306
PERIOD 5 TOTALS		-	47,800	-	-	-	-	20,753	10,221	78,775	91	1,527	77,158	-	-	-	-	-	-	440,667	239,306
TOTAL COST TO DECOMMISSION		12,955	119,914	8,874	6,367	4,400	29,490	558,271	125,255	865,527	654,337	121,347	89,843	230,250	101,999	2,629	470	505	17,555,500	1,410,261	5,392,403

Table E-2
Braidwood Nuclear Power Station, 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	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

TOTAL COST TO DECOMMISSION WITH 16.92% CONTINGENCY:	$865,527	thousands of 2009 dollars
TOTAL NRC LICENSE TERMINATION COST IS 75.6% OR:	$654,337	thousands of 2009 dollars
SPENT FUEL MANAGEMENT COST IS 14.02% OR:	$121,347	thousands of 2009 dollars
NON-NUCLEAR DEMOLITION COST IS 10.38% OR:	$89,843	thousands of 2009 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	105,098	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	505	cubic feet
TOTAL SCRAP METAL REMOVED:	76,977	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,410,261	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

ATTACHMENT 2

Braidwood Station, Units 1 and 2
Radiological Decommissioning Projected SAFSTOR Cash Flow
(dollars, thousands)

Year	Braidwood Unit 1 Radiological Decommissioning Cost (December 31, 2009 dollars)	Braidwood Unit 2 Radiological Decommissioning Cost (December 31, 2009 dollars)
2026	$9,575	$0
2027	$51,972	$1,906
2028	$12,542	$51,575
2029	$3,646	$41,993
2030	$3,646	$3,660
2031	$3,646	$3,660
2032	$3,653	$3,670
2033	$3,642	$3,655
2034	$3,642	$3,652
2035	$3,642	$3,652
2036	$3,652	$3,662
2037	$3,642	$3,652
2038	$3,642	$3,652
2039	$3,642	$3,652
2040	$3,652	$3,662
2041	$3,642	$3,652
2042	$3,642	$3,652
2043	$3,642	$3,652
2044	$3,652	$3,662
2045	$3,641	$3,652
2046	$3,618	$3,639
2047	$3,618	$3,639
2048	$3,628	$3,649
2049	$3,618	$3,639
2050	$3,618	$3,639
2051	$3,618	$3,639
2052	$3,628	$3,649
2053	$3,618	$3,639
2054	$3,618	$3,639
2055	$3,618	$3,639
2056	$3,628	$3,649
2057	$3,618	$3,639
2058	$3,618	$3,639
2059	$3,618	$3,639
2060	$3,628	$3,649
2061	$3,618	$3,639
2062	$3,618	$3,639
2063	$3,618	$3,639
2064	$3,628	$3,649

ATTACHMENT 2

Braidwood Station Units 1 and 2
Radiological Decommissioning Projected SAFSTOR Cash Flow (continued)
(dollars, thousands)

Year	Braidwood Unit 1 Radiological Decommissioning Cost (December 31, 2009 dollars)	Braidwood Unit 2 Radiological Decommissioning Cost (December 31, 2009 dollars)
2065	$3,618	$3,639
2066	$3,618	$3,639
2067	$3,618	$3,639
2068	$3,628	$3,649
2069	$3,618	$3,639
2070	$3,618	$3,639
2071	$3,618	$3,639
2072	$3,628	$3,649
2073	$3,618	$3,639
2074	$3,618	$3,639
2075	$3,618	$3,639
2076	$3,628	$3,649
2077	$3,618	$3,639
2078	$3,618	$3,639
2079	$13,735	$3,639
2080	$50,832	$16,396
2081	$99,137	$37,226
2082	$79,341	$98,699
2083	$42,572	$74,359
2084	$33,393	$61,543
2085	$2,178	$61,375
2086	$22,018	$26,877
2087	$85	$37
2088	$86	$37
2089	$23	$10
Total	**$598,915**	**$654,337**