

Report on Waste Burial Charges

Changes in Decommissioning
Waste Disposal Costs at
Low-Level Waste Burial Facilities

Draft Report for Comment

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Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities

Draft Report for Comment

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ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC) requires nuclear power reactor licensees to adjust annually, in current year dollars, their estimate of the cost of decommissioning their plants as part of the process providing reasonable assurance that adequate funds for decommissioning will be available when needed. This NUREG, which is periodically revised, provides and explains a formula acceptable to the NRC for determining the minimum decommissioning fund requirements for nuclear power plants. The sources of information used in the formula are identified, and the values developed for the estimation of radioactive waste burial/disposition costs, by site and year, are given.

This 16th revision of NUREG-1307 "Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities," contains disposal costs updated to the year 2016 for the reference pressurized-water reactor (PWR) and for the reference boiling-water reactor (BWR). Three different options for estimating these costs are presented. Licensees may use the formula, coefficients, and burial/disposition adjustment factors from this NUREG in their cost analyses, or they may use adjustment factors derived from any methodology that results in a total cost estimate of no less than the amount estimated by using the parameters presented in this NUREG.

The first option assumes that 100-percent of the low-level waste (LLW) generated during decommissioning is disposed of at one of the three compact-affiliated disposal facilities, which are located in Richland, Washington; Barnwell, South Carolina; and Andrews County, Texas. This is the first revision of NUREG-1307 to include costs for the Andrews County, Texas, site, which became operational in 2012. Ratios of year 2016 disposal costs to the original year 1986 disposal costs (i.e., Bx factors) are also provided for the Washington, South Carolina, and Texas facilities. For historical purposes, disposal costs for the reference reactors and ratios of disposal costs at the Washington and South Carolina sites for the years 2004, 2006, 2008, 2010, and 2012 are also provided. See previous revisions of NUREG-1307 for disposal costs prior to 2004.

The second option provides for disposing of LLW using a combination of non-compact and compact-affiliated disposal facilities. This option allows nuclear power plant (NPP) licensees to take advantage of potentially lower disposal costs for some of their decommissioning LLW. As with the first option, ratios of the alternative disposal costs to the original year 1986 disposal costs (i.e., Bx factors) are provided.

The third option provides for disposing of all LLW at a non-compact affiliated disposal facility. This option allows generators to dispose of all LLW at the Clive, Utah and Andrews County, Texas disposal facilities.

Several sample calculations for estimating the burial/disposition cost for each of the options are presented, demonstrating the use of the data contained in this NUREG.

Estimated disposal costs for 2016 using only the Washington disposal site, which accepts LLW from members of the Northwest and Rocky Mountain Compacts, are about 19-percent higher for the reference PWR and 8.7-percent higher for the reference BWR when compared to 2012 costs. The increases in disposal costs were driven by increases in the site surveillance fee. The increase in the PWR disposal cost was also due to a revision in the treatment of combustible waste to be consistent with the basis document NUREG/CR-0130. Disposal costs for the option in which a portion of decommissioning LLW is disposed of at a non-compact

1 disposal facility are about 10-percent higher for the PWR and 9.7-percent higher for the BWR
2 when compared to 2012 costs. The increases are predominantly due to increases in the non-
3 compact facility disposal rates.

4 Estimated disposal costs for 2016 using only the South Carolina disposal site, which accepts
5 LLW from members of the Atlantic Compact, are about 1.7-percent lower for the reference PWR
6 and 3.5-percent lower for the reference BWR when compared to 2012 costs. Increases in
7 disposal costs for weight, curie, and irradiated hardware charges were offset by a revision in the
8 treatment of evaporator/concentrator bottoms to be consistent with the basis documents
9 NUREG/CR-0130 and NUREG/CR-0672. Disposal costs for the option in which a portion of the
10 decommissioning LLW is disposed of at a non-compact disposal facility are about 21-percent
11 lower for the PWR and 14-percent lower for the BWR when compared to 2012 costs. The
12 increases in the non-compact disposal facility rates were offset by decreases due to: 1) the
13 revision in the treatment of evaporator/concentrator bottoms previously described and 2)
14 revision in the classification of several components from Class B/C to Class A, again to be
15 consistent with the basis documents NUREG/CR-0130 and NUREG/CR-0672.

16 Revision 16 to NUREG 1307 assumes that LLW generated from day-to-day plant operations
17 would be disposed of using the licensee's operating funds, and thus would not rely on
18 decommissioning funds identified in the formula calculation. However, facilities located in states
19 that are members of an LLW Compact with no available LLW disposal site may be forced to
20 provide interim storage for this waste (although most LLW may be able to be disposed of at the
21 non-compact disposal facility located in Clive, Utah or at the compact-affiliated disposal facility
22 located in Andrews County, Texas). Accordingly, some of the LLW may ultimately need to be
23 disposed of during decommissioning following interim storage. This volume can become
24 significant for those plants operating through extended license terms, and the disposal cost
25 would not be accounted for in a decommissioning trust fund based on the formula calculation.

26 For plants that have no disposal site available within their designated LLW Compact, NUREG
27 1307, Revision 16, assumes that the cost for disposal of Class A LLW is the same as that for the
28 Clive, Utah, disposal facility and for Class B and C LLW, the cost would be the same as that for
29 the Andrews County, Texas, disposal facility including accounting for out-of-compact fees. As
30 new disposal options become available, they will be incorporated into subsequent revisions of
31 NUREG-1307.

FOREWORD

Nuclear power reactor licensees are required by section 50.75 to Title 10 of the *Code of Federal Regulations* (10 CFR), "Reporting and Recordkeeping for Decommissioning Planning," to annually adjust the estimated decommissioning costs of their nuclear facilities to ensure adequate funds are available for decommissioning. The regulation (§ 50.75(c)(2)) references NUREG-1307 as the appropriate source for obtaining the adjustment factor for waste burial/disposition costs. This sixteenth revision of NUREG-1307 provides current, as of August 2016, waste burial/disposition costs using the compact-affiliated disposal facilities located in Richland, Washington; Barnwell, South Carolina; and Andrews County, Texas, and for the non-compact disposal facility in Clive, Utah. In addition, this revision also includes an alternative disposal cost that provides the option of disposing of low-level waste (LLW) using a combination of non-compact and compact-affiliated disposal facilities. Licensees can factor these numbers into the adjustment formula, as specified in 10 CFR 50.75(c)(2), to determine the minimum decommissioning fund requirement for their nuclear facilities. Although this NUREG is specifically prepared for the use of power reactor licensees, it also can be a valuable source of information for material licensees on current waste burial/disposition costs.

On July 1, 2000, the Barnwell disposal facility at Barnwell, South Carolina, became the host disposal facility for the newly formed Atlantic Compact, comprised of the States of Connecticut, New Jersey, and South Carolina. Effective July 1, 2008, LLW from States that are not members of the Atlantic Compact was no longer accepted at the Barnwell disposal facility. The South Carolina Public Service Commission annually determines the costs of waste disposal at the Barnwell disposal facility and provides the site operator with an allowable operating margin.

The Richland, Washington, facility only accepts LLW from the Northwest and Rocky Mountain Compacts. The Northwest Compact is comprised of the States of Idaho, Montana, Oregon, Utah, Washington, and Wyoming. The Rocky Mountain Compact is comprised of the States of Colorado, Nevada, and New Mexico. The costs of disposal for this facility are determined annually based on waste generator volume projections and a maximum annual operator revenue set by the Washington Utilities and Transportation Commission. If the total operator revenue is exceeded in a given year, a rebate may be sent to the waste generator.

The Andrews County, Texas, facility or Texas Compact Waste Facility (CWF) accepts LLW from both the Texas Compact and out-of-compact generators. The fees for LLW disposal are determined by the Texas Commission on Environmental Quality. Out-of-compact generators, however, must submit an import petition to the Texas Compact Commission for approval prior to shipping. The State of Texas also limits total non-compact waste disposed at the CWF to 30-percent of licensed capacity.

Since the Barnwell and Richland LLW disposal facilities are available only to nuclear facilities located within the respective compacts, another option available to licensees is to dispose of decommissioning Class A LLW at a non-compact disposal facility. Costs for this option are based on a price quote received from the operator of the non-compact disposal facility located in Clive, Utah. This NUREG provides waste burial/disposition adjustment factors for this option, in addition to the standard option of disposing of 100-percent of decommissioning LLW at a compact-affiliated disposal facility.

Revision 16 to NUREG-1307 assumes that LLW generated during plant operations is disposed of using operating funds. Plants that are members of an LLW Compact that has no disposal site available for LLW may be forced to provide interim storage for this waste, although most LLW

1 may be able to be disposed of at the non-compact disposal facility located in Clive, Utah or at
2 the compact-affiliated disposal facility located in Andrews County, Texas. The LLW volume
3 could be significant for plants with extended operating periods (e.g., beyond 40-years), and the
4 disposal cost of this additional volume may not be accounted for in a decommissioning trust
5 fund based on the formula calculation.

6 For plants that have no disposal site available within their designated LLW Compact, NUREG-
7 1307, Revision 16, assumes that the cost for disposal of Class A LLW is the same as that for
8 the Clive, Utah disposal facility and for Class B and C LLW is the same as that for the Andrews
9 County, Texas disposal facility including accounting for out-of-compact fees. Accordingly, given
10 these considerations, licensees may want to set aside additional decommissioning trust funds to
11 avoid significant future shortfalls in funding and potential enforcement actions.
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1 INTRODUCTION

Nuclear power reactor licensees are required by section 50.75 to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.75, "Reporting and Recordkeeping for Decommissioning Planning," to annually adjust the estimated decommissioning costs (in current year dollars) of their nuclear facilities to ensure adequate funds are available for decommissioning. This is one step of a multi-step process of providing reasonable assurance to the NRC that adequate funds for decommissioning will be available when needed. This NUREG provides adjustment factors for the waste burial/disposition component of the decommissioning fund requirement, as required by 10 CFR 50.75(c)(2). This NUREG also provides the regional adjustment factors for the labor and energy components of the decommissioning fund requirement. The term "adjustment factor," as used in this NUREG and in 10 CFR 50.75(c)(2), refers to increases and decreases in decommissioning costs since the § 50.75 regulations were issued. The decommissioning fund requirements in these regulations are in 1986 dollars. This NUREG is updated periodically to reflect changes in waste burial/disposition costs.

This NUREG provides the development of a formula for estimating decommissioning cost that is acceptable to the NRC. Sources of information used in the formula are identified. Values developed for the adjustment of radioactive waste burial/disposition costs, by site and by year, are also given. Licensees may use the formula, the coefficients, and the burial/disposition adjustment factors from this NUREG in their analyses, or they may use an adjustment rate at least equal to the approach presented herein.

The formula and its coefficients, together with guidance to the appropriate sources of data needed, are summarized in Chapter 0. The development of the formula and its coefficients, with sample calculations, are presented in Chapter 0. Price schedules for burial/disposition for the year **2016** are given in 0 for compact-affiliated and non-compact disposal facilities. Calculations to determine the burial/disposition adjustment factors, B_x , for each site and year of evaluation are summarized in 0.

1.1 Definitions

This section provides the definition of certain terms utilized throughout this NUREG.

Low-level radioactive waste (LLW). LLW is a general term for a wide range of items that have become contaminated with radioactive material or have become radioactive through exposure to neutron radiation. Radioactive materials are present at decommissioning nuclear power plants as the result of plant operations prior to permanent shutdown and as the result of decommissioning activities. Examples include radioactively contaminated equipment, piping, tanks, hardware, and tools; concrete debris and soil; liquid radioactive waste (radwaste) treatment residues; and radioactively contaminated protective shoe covers and clothing; cleaning rags, mops, and filters.. The radioactivity in these wastes can range from just above natural background levels to much higher levels, such as seen in components from inside the reactor vessel in a nuclear power plant. LLW from decommissioning activities is typically shipped to a disposal site specifically licensed for disposal of LLW.

LLW Classification. 10 CFR 61.55(a)(2) defines three classes of LLW acceptable for routine near-surface disposal based on its radiological and physical characteristics:

(i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in § 61.56(a). If Class A waste also meets the stability requirements set forth in § 61.56(b), it is not necessary to segregate the waste for disposal.

(ii) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in § 61.56.

(iii) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in § 61.56.

LLW Compacts. The Low Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPA) makes each state responsible for disposing of the LLW generated within its boundaries and establishes a mechanism for states to enter into compacts to establish regional LLW disposal facilities. Appendix E identifies the compacts that have been formed and the states affiliated with each. Appendix E also identifies the states that are not affiliated with any compact.

Compact-affiliated Disposal Facility. An LLW disposal facility that has been established by a compact in accordance with the LLRWPA. Four compacts, representing 16 states, have established LLW disposal facilities: (1) Northwest Compact and Rocky Mountain Compact – U.S. Ecology’s disposal facility located in Richland, Washington, (2) Atlantic Compact – EnergySolutions’ disposal facility located in Barnwell, South Carolina, and (3) Texas Compact – Waste Control Specialists’ disposal facility located in Andrews County, Texas.

Non-compact Disposal Facility. An LLW disposal facility that was established outside of the framework of the LLRWPA and is not affiliated with a compact. Only one LLW disposal facility meets this definition – the EnergySolutions’ disposal facility located in Clive, Utah.

1.2 LLW Disposal Cost Options

NUREG-1307, Revision 16, contains disposal costs updated to the year 2016 for the reference pressurized-water reactor (PWR) and the reference boiling-water reactor (BWR). Three different options for estimating these costs are presented. The first option assumes that 100-percent of the low-level waste (LLW) generated during decommissioning is disposed of at one of the three compact-affiliated disposal facilities located, in Richland, Washington, Barnwell, South Carolina, and Andrews County, Texas. This is the first revision of NUREG-1307 to include costs for the Andrews County, Texas, site, which became operational in 2012. Ratios of 2016 disposal costs to the original 1986 disposal costs (i.e., B_x factors) are also provided. For historical purposes, disposal costs for the reference reactors and ratios of disposal costs at the Washington and South Carolina sites for the years 2004, 2006, 2008, 2010, and 2012 are also provided. See previous revisions of NUREG-1307 for disposal costs prior to 2004.

The second option provides for disposing of LLW using a combination of non-compact and compact-affiliated disposal facilities. For a PWR under this option, 93-percent of the LLW is

1 assumed to be disposed of at a non-compact disposal facility (Clive, Utah) and the remaining 7-
2 percent is assumed to be disposed of at a compact-affiliated disposal facility. For a BWR under
3 this option, 95-percent of the LLW is assumed to be disposed of at a non-compact disposal
4 facility (Clive, Utah) and the remaining 5-percent is assumed to be disposed of at a compact-
5 affiliated disposal facility. This option, which is accepted as an alternative for licensees to
6 pursue, allows NPP licensees to take advantage of potentially lower disposal costs for much of
7 their LLW waste. Ratios of the 2016 alternative disposal costs to the original year 1986 disposal
8 costs (i.e., B_x factors) are also provided.

9 The third option provides for disposing of all LLW at non-compact-affiliated disposal facilities or
10 compact-affiliated disposal facilities that accept out-of-compact waste.

11 NUREG-1307, Revision 16, assumes that LLW generated during plant operations is disposed
12 of using operating funds. Plants that are members of an LLW Compact that has no disposal site
13 available for LLW may be forced to provide interim storage for this waste (although most LLW
14 may be able to be disposed of at the non-compact disposal facility located in Clive, Utah or at
15 the compact-affiliated disposal facility located in Andrews County, Texas facility). Some of this
16 waste may ultimately need to be disposed of during decommissioning. This LLW could be
17 significant for plants with extended operating periods (e.g., beyond 40-years), and the disposal
18 cost of this additional volume may not be accounted for in a decommissioning trust fund based
19 on the formula calculation.

20 For plants that have no disposal site available within their designated LLW Compact,
21 NUREG-1307, Revision 16, assumes that the cost for disposal of Class A LLW is the same as
22 that for the Clive, Utah, disposal facility, and that the cost for disposal of Class B and C LLW is
23 the same as that for the Andrews County, Texas, disposal facility, including accounting for out-
24 of-compact fees. As new disposal options become available, they will be incorporated into
25 subsequent revisions of NUREG-1307.

26

2 SUMMARY

The elements of decommissioning cost, per 50.75(c)(2)), are assigned to three categories: (1) those that are proportional to labor costs, L_x ; (2) those that are proportional to energy costs, E_x ; and (3) those that are proportional to burial costs, B_x . The adjustment of the total decommissioning cost estimate can be expressed by:

$$\text{Estimated cost (Year X)} = [1986 \$ \text{ cost}] [A \cdot L_x + B \cdot E_x + C \cdot B_x]$$

where A, B, and C are the fractions of the total 1986 dollar costs attributable to labor (0.65), energy (0.13), and burial (0.22), respectively, and sum to 1.0. The factors L_x , E_x , and B_x are defined by:

L_x = labor cost adjustment factor, January of 1986 to the latest month of Year X for which data are available,

E_x = energy cost adjustment factor, January of 1986 to the latest month of Year X for which data are available, and,

B_x = LLW burial/disposition cost adjustment factor, January of 1986 to the latest month of Year X for which data are available.

Licensees are to evaluate L_x and E_x for the years subsequent to 1986 based on the national producer price indexes, national consumer price indexes, and local conditions for a given site (see Chapter 3).

B_x is evaluated by recalculating the costs of burial/disposition of the radioactive wastes from the reference PWR (Ref. 1) and the reference BWR (Ref. 2) based on the price schedules provided by the available disposal facilities for the year of interest. The results of these recalculations are presented in Table 2-1, by site and by year.

Effective January 1, 1993, radioactive waste from States that are not members of the Northwest Compact (comprised of Idaho, Montana, Oregon, Utah, Washington, and Wyoming) or Rocky Mountain Compact (comprised of Colorado, Nevada, and New Mexico) was no longer accepted at the Washington disposal site.

Effective July 1, 2000, the South Carolina LLW burial site applied different price schedules for waste from States within and outside the then-newly created Atlantic Compact (comprised of South Carolina, Connecticut, and New Jersey). Effective July 1, 2008, radioactive waste from States that are not members of the Atlantic Compact was no longer accepted at the South Carolina disposal site.

Beginning in the spring of 2012, a new LLW disposal facility became available for disposal of waste from States within the Texas Compact (comprised of Texas and Vermont). Disposal costs for this facility are included in Revision 16 for the first time. This new disposal option will likely result in materially reduced LLW burial charges for nuclear power plants located in states within the Texas Compact.

Licensees not located in the Northwest, Rocky Mountain, Atlantic, or Texas Compacts should use the B_x values for "Generators Located in States Not Affiliated with a Compact having a Disposal Facility" (see footnote (c) in Table 2-1).

Effective with Revision 8 of this NUREG (December 1998), the option to use a combination of waste vendors, or non-compact disposal facilities, and compact-affiliated disposal facilities was made available, and was referred to as “Direct Disposal with Vendors.”

Effective with Revision 15 of this NUREG (January 2013), the nomenclature for the two disposal options as used in the previous revisions of NUREG-1307, (referred to as “Direct Disposal” and “Direct Disposal with Vendors,”) was changed to “Compact-Affiliated Disposal Facility Only” and “Combination of Compact-Affiliated and Non-Compact Disposal Facilities,” to better describe these options. The B_x values for this option are also provided in Table 2-1 (see footnotes (d) and (e) in Table 2-1). The decision rests with the licensees to determine the option that best represents their particular situation.

Table 2-1 Values of B_x as a Function of LLW Burial Site and Year^(a)

	B _x Values for Washington Site				B _x Values for South Carolina Site				B _x Values for Texas Site ^(b)				B _x Values for Generators Located in the Unaffiliated States and those Located in Compact-Affiliated States having no Disposal Facility ^(c)	
	Compact-Affiliated Disposal Facility Only ^(e)		Combination of Compact-Affiliated and Non-Compact Disposal Facilities ^(d,e)		Compact-Affiliated Disposal Facility Only ^(e)		Combination of Compact-Affiliated and Non-Compact Disposal Facilities ^(d,e)		Compact-Affiliated Disposal Facility Only ^(e)		Combination of Compact-Affiliated and Non-Compact Disposal Facilities ^(d,e)			
Year	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR
2016	8.706	7.290	8.129	6.668	30.061	26.329	10.971	12.111	8.508	8.293	10.672	10.441	12.471	13.132
2012	7.335	6.704	7.375	6.076	30.581	27.295	13.885	14.160	NA	NA	NA	NA	NA	NA
2010	8.035	7.423	6.588	5.458	27.292	24.356	12.280	12.540	NA	NA	NA	NA	NA	NA
2008	8.283	23.185	5.153	20.889	25.231	22.504	9.872	11.198	NA	NA	NA	NA	NA	NA
2006	6.829	11.702	3.855	9.008	22.933	20.451	8.600	9.345	NA	NA	NA	NA	NA	NA
2004	5.374	13.157	3.846	11.755	19.500	17.389	7.790	8.347	NA	NA	NA	NA	NA	NA

(a) The values shown in this table are developed in 0, with all values normalized to the 1986 Washington PWR and BWR values by dividing the calculated burial costs for each site and year by the Washington site burial costs calculated for the year 1986.

(b) Effective with NUREG-1307, Revision 16, the Compact Waste Facility (CWF) in Andrews County, Texas, is available as a full-service (i.e., Class A, B, and C) LLW disposal facility for waste generators located in States affiliated with the Texas Compact. Hence, B_x values are not available (NA) for earlier versions of NUREG-1307.

(c) Effective with NUREG-1307, Revision 16, the CWF in Andrews County, Texas, is also available as a full-service (i.e., Class A, B, and C) LLW disposal facility for waste generators located in States not affiliated with the Texas Compact. Out-of-compact generators, however, must submit an import petition to the Texas Compact Commission for approval prior to shipping. The State of Texas also limits total non-compact waste disposed at the CWF to 30-percent of licensed capacity and imposes additional fees on LLW disposed of from out-of-compact generators. With the availability of this full-service disposal facility to out-of-compact waste generators and the Clive, Utah disposal facility for any Class A LLW generated in the U.S., the Generic LLW Disposal Site option used in previous versions of NUREG-1307 is replaced with this option, which provides B_x values representing a composite of the disposal rates for these two disposal facilities.

(d) Effective with NUREG-1307, Revision 8 (Ref. 3), an alternative disposal option was introduced in which the bulk of the LLW is assumed to be dispositioned by waste vendors. Effective with NUREG-1307, Revision 14, the bulk of the LLW is assumed to be dispositioned at the Clive, Utah disposal facility.

(e) Effective with NUREG-1307, Revision 15, the nomenclature for the two disposal options, referred to as “Direct Disposal” and “Direct Disposal with Vendors” in previous revisions of NUREG-1307, was changed to “Compact-Affiliated Disposal Facility Only” and “Combination of Compact-Affiliated and Non-Compact Disposal Facilities” to better describe these options.

(f) The large decrease in Washington Site disposal costs from 2008 to 2010 for the BWR was driven by a decrease in dose rate charges due to a cap placed on these charges by the State of Washington. The large increase in Washington Site disposal costs from 2006 to 2008 was driven by an increase in dose rate charges

3 DEVELOPMENT OF COST ADJUSTMENT FORMULA

The evaluations presented in this chapter are based on information presented in NUREG/CR-0130, "Technology, Safety and Costs of Decommissioning a Reference Pressurized-Water Reactor Power Station—Technical Support for Decommissioning Matters Related to Preparation of the Final Decommissioning Rule," Addendum 4, and NUREG/CR-0672, "Technology, Safety and Costs of Decommissioning a Reference Boiling-Water Reactor Power Station—Technical Support for Decommissioning Matters Related to Preparation of the Final Decommissioning Rule," Addendum 3 (Refs. 1, 2), in which the estimated costs for immediate dismantlement of the reference PWR and the reference BWR are adjusted to January 1986 dollars. As specified in 10 CFR 50.75(c)(2), decommissioning costs are divided into three general categories. They are: (1) labor, materials, and services, (2) energy and waste transportation, and (3) radioactive waste burial/disposition. A simple equation can be used to determine the minimum decommissioning fund requirement in year **2016**, or previous year dollars, as follows:

Estimated cost (Year X) = $[1986 \$ \text{ Cost}] * (A * L_x + B * E_x + C * B_x)$ where:

Estimated cost (Year X) = estimated decommissioning costs in Year X dollars,

[1986 \$ Cost] = estimated decommissioning costs in 1986 dollars,

A = fraction (also referred to as coefficient) of the [1986 \$ Cost] attributable to labor, materials, and services (0.65),

B = fraction (also referred to as coefficient) of the [1986 \$ Cost] attributable to energy and transportation (0.13),

C = fraction (also referred to as coefficient) of the [1986 \$ Cost] attributable to waste burial (0.22),

L_x = labor, materials, and services cost adjustment, January of 1986 to latest month of Year X for which data are available,

E_x = energy (electricity and fuel oil) and waste transportation cost adjustment, January of 1986 to latest month of Year X for which data are available,

B_x = Low-level waste (LLW) burial/disposition cost adjustment, January of 1986 to the latest month of Year X for which data are available,

= $(R_x + \Sigma S_x) / (R_{1986} + \Sigma S_{1986})$, where:

R_x = radioactive waste burial/disposition costs (excluding surcharges) in Year X dollars,

ΣS_x = summation of surcharges in Year X dollars,

R_{1986} = radioactive waste burial costs (excluding surcharges) in 1986 dollars, and

ΣS_{1986} = summation of surcharges in 1986 dollars.

Values for L_x and E_x for years subsequent to 1986 are to be based on the national producer price indexes, national consumer price indexes, and local conditions for a given site, as outlined below in Sections 3.1 and 3.2. Thus, the licensee can evaluate these parameters appropriately for a particular site. The values to be used in determining B_x are taken from published cost schedules at the two compact-affiliated disposal facilities and a price quote from the non-compact disposal facility located in Clive, Utah.

Values of B_x for the year 2012, and for earlier years, are provided to licensees through this NUREG for information purposes only.

The major elements of the three categories of the decommissioning cost estimates for both the reference PWR and BWR are provided in Table 3-1. As can be seen, the C coefficients are the same for both PWR and BWR, while the A and B coefficients are only slightly different between the two reactor types. Considering the uncertainties and contingencies contained within these numbers, and considering that the values of the coefficients for the PWR and the BWR are so similar, the formula in 10 CFR 50.75(c)(2) was simplified to be a composite of the two reactor types by averaging the A and B coefficients derived from the separate PWR and BWR estimates. Hence, the 10 CFR 50.75(c)(2) formula for determining the decommissioning cost of both PWR and BWR reactor types assume the same coefficients, as follows:

$$A_{ave} = 0.65 \quad B_{ave} = 0.13 \quad C_{ave} = 0.22$$

Table 3-1 Evaluation of the Coefficients A, B, and C in January 1986 Dollars

Cost Category	Reference PWR Values		Reference BWR Values	
	1986 \$ (millions)	Coefficient	1986 \$ (millions)	Coefficient
Labor	17.98 ^(a)		35.12 ^(b)	
Equipment	1.64 ^(a)		4.03 ^(b)	
Supplies	3.12 ^(a)		3.71 ^(b)	
Contractor	12.9 ^(a)		21.1 ^(b)	
Insurance	1.9 ^(a)		1.9 ^(b)	
Containers	10.9 ^(d)		8.14 ^(c)	
Added Staff	7.5 ^(a)		4.4 ^(b)	
Added Supplies	1.2 ^(a)		0.2 ^(b)	
Spec. Contractor	0.78 ^(a)		0.71 ^(b)	
Pre-engineering	7.4 ^(a)		7.4 ^(b)	
Post-TMI-backfits	0.9 ^(a)		0.1 ^(b)	
Surveillance	0.31 ^(a)		--	
Fees	0.14 ^(a)		0.14 ^(b)	
Subtotal	66.67	A = 0.64	86.95	A = 0.66
Energy	8.31 ^(a)		8.84 ^(b)	
Transportation	6.08 ^(d)		7.54 ^(c)	
Subtotal	14.39	B = 0.14	16.38	B = 0.12
Burial	22.48 ^(d)	C = 0.22	29.98 ^(c)	C = 0.22
Total	103.54		133.31	
Note: All costs include a 25-percent contingency factor.				
(a) Based on Table 3.1, NUREG/CR-0130, Addendum 4.				
(b) Based on Table 3.1, NUREG/CR-0672, Addendum 3.				
(c) Based on Table 5.2, NUREG/CR-0672, Addendum 3.				
(d) Based on Table 6.2, NUREG/CR-0130, Addendum 4.				

3.1 Labor Adjustment Factors

Current employment cost indexes for labor (column 3, Table , below) can be obtained from the "Employment Cost Indexes," published by the U.S. Department of Labor, Bureau of Labor Statistics (BLS) (Ref. 4). Specifically, the appropriate regional data from Table 6 of Reference 4 entitled "Employment Cost Index for total compensation, for private industry workers, by bargaining status, census region and division, and metropolitan area status" should be used. These indexes may also be obtained from BLS databases available on the Internet (see Appendix C for instructions).

To calculate the current labor adjustment factor (L_x) for a particular region, two numbers are needed: a base labor adjustment factor, and the current Employment Cost Index (ECI). The base labor adjustment factors are shown in column 2 of Table , and the current ECIs are shown in column 3. The base labor adjustment factor is the value of L_x at the time the ECI was most recently re-indexed. (This latest re-indexing occurred in December 2005, at which time the index was reset to 100.) As such, current values of L_x (column 4) are obtained from the simple proportion:

$$L_x/ECI = \text{Base } L_x/100$$

For example, for the Northeast region,

$$L_x/127.3 = 2.16/100$$

or

$$L_x = 2.16 \times 127.3 / 100 = 2.75$$

Table 3-2 Regional Factors for Labor Cost Adjustment

Region	Base L_x (Dec 2005)	Qtr 1 2016 ECI (Dec 2005 = 100)	L_x (Qtr 1 2016)
Northeast	2.16	127.3	2.75
South	1.98	125.1	2.48
Midwest	2.08	123.4	2.57
West	2.06	126.2	2.60

3.2 Energy Adjustment Factors

The adjustment factor for energy, E_x , is a weighted average of two components: industrial electric power, P_x , and light fuel oil, F_x . For the reference PWR, E_x is given by:

$$E_x (\text{PWR}) = 0.58P_x + 0.42F_x$$

and for the reference BWR E_x is given by:

$$E_x (\text{BWR}) = 0.54P_x + 0.46F_x$$

These equations are derived from Table 6-3 of Reference 1 and Table 5-3 of Reference 2. The current values of P_x and F_x are calculated from the Producer Price Indexes (PPI), available in the "PPI Detailed Report," published by the U.S. Department of Labor, BLS (Ref. 5). These indexes also can be obtained from BLS databases available on the Internet (see 0 for instructions). The indexes used to calculate P_x should be taken from data for industrial electric power (PPI Commodity Code 0543), and the indexes used to calculate F_x should be taken from data for light fuel oils (PPI Commodity Code 0573). No regional BLS data for these PPI commodity codes are currently available.

P_x and F_x are the values of current producer price indexes (PPI Codes 0543 and 0573, respectively) divided by the corresponding indexes for January 1986. All PPI values are based on a value of 100 for the year 1982 (base 1982 = 100). Thus, the values of P_x and F_x for March 2016 (latest data available) are:

$P_x = 203.5$ (March 2016 value of code 0543) \div

114.2 (January 1986 value of code 0543) $= 1.782$

$F_x = 119.3$ (March 2016 value of code 0573) \div

82.0 (January 1986 value of code 0573) $= 1.455$

The value of E_x for the reference PWR, therefore, is:

E_x (PWR) $= [(0.58 \times 1.782) + (0.42 \times 1.455)] = 1.645$.

This value of $E_x = 1.645$ should then be used in the equation to adjust the energy cost (to March 2016 dollars) for decommissioning a PWR.

For the reference BWR,

E_x (BWR) $= [(0.54 \times 1.782) + (0.46 \times 1.455)] = 1.632$.

3.3 Waste Burial Adjustment Factors

The waste burial adjustment factors, B_x , for the year 2016 are provided in Table 2-1 for each of the LLW disposal sites.

To calculate the B_x for a particular LLW burial site, the cost of disposal of each of the radioactive materials identified in Table 3-3 was first estimated using the year 2016 price schedules provided in Appendix A of this report for each of the LLW disposal facilities. The cost of disposal for each of the radioactive materials was calculated based on numerous factors, including its classification (e.g., Class A, B, and C), its weight and volume, the number of packages, the number of shipments, its activity, and its surface dose rate. These factors are reported in NUREG/CR-0130 and NUREG/CR-0672 (Refs 6, 7), and associated Addendums 3 and 2 (Refs 8, 9), respectively. The estimated disposal cost was summed for all radioactive materials and then divided by the 1986 disposal cost estimate identified in Table 3-1 to develop the year 2016 B_x factors reported in Table 2-1.

A comparison of the year 2016 B_x factors in Table 2-1 to the corresponding year 2012 B_x factors reported in Revision 15 of NUREG-1307, shows that the values increased for the Washington site and decreased for the South Carolina site. These changes were influenced by two significant factors: (1) changes in the disposal price schedules provided by the operators of the disposal facilities (see Appendix A) and (2) changes made to the contractor's cost model to correct errors identified during a model re-validation effort.

Regarding changes to the disposal price schedules, the following summarizes the changes:

- For the Washington disposal facility, the volume and shipment disposal rates and the dose rate charge per container increased while the annual site charges, charges per container, and site surveillance fee decreased.
- For the South Carolina disposal facility, all of the charges and surcharges increased except for the Atlantic Compact Commission administrative surcharge, which remained unchanged.

- For the Utah disposal facility, the disposal rates for both solid and liquid LLW increased.
- No changes are reported for the Texas disposal facility since this is the first revision of NUREG-1307 to include disposal of LLW from decommissioning at this facility.

Accounting for these changes alone would have resulted in an across-the-board increase in the B_x factors compared to the year 2012 B_x factors. However, these increases, in some cases, have been offset by decreases resulting from changes made to the contractor's cost models to correct errors identified during a model re-validation effort. In this effort, assumptions made in the cost models were re-validated against the technical basis documents NUREG/CR-0130 and NUREG/CR-0672 and associated addendums (Refs 1, 2, 6, 7, 8, 9). The following summarizes the changes made to the cost model assumptions as a result of this re-validation effort:

- The number of packages of combustible LLW for PWRs was adjusted upward to be consistent with Section G.4.2.3 of NUREG/CR-0130 (Ref 6). The waste classification of this combustible waste was also revised to be consistent with Table 6.7 of NUREG/CR-0130, Addendum 3 (Ref 8).
- The activity of PWR evaporator bottoms¹ was adjusted downward to be consistent with Table 5.7 of NUREG/CR-0130, Addendum 3 (Ref 8). The classification of these evaporator bottoms was also revised to be consistent with Table 6.7 of Addendum 3. Similarly, the activity of BWR concentrator bottoms was adjusted downward to be consistent with Table 5.9 of NUREG/CR-0672, Addendum 2 (Ref 9). The classification of these concentrator bottoms was also revised to be consistent with Table 6.8 of Addendum 2.
- In addition to the LLW classification changes identified in the above two bullets, the classification of several other radioactive material types identified in Table 3-3 for both PWR and BWR were revised to be consistent with the classifications in NUREG/CR-0130, Addendum 3, and NUREG/CR-0672, Addendum 2, respectively.

¹ Evaporator or concentrator bottoms are the residual liquids (containing high concentrations of solids) that are generated during decommissioning by the liquid radwaste cleanup system. This system utilizes an evaporator to minimize the volume of radioactive liquid waste generated from decontamination operations and that requires solidification and disposal as LLW.

1 **Table 3-3 Radioactive Materials Included in the Estimate of LLW Burial Cost**

PWR	BWR
Vessel Wall	Steam Separator
Vessel Head & Bottom	Fuel Support Pieces
Upper Core Support Assembly	Control Rods & In-core Instruments
Upper Support Column	Control Rod Guide Tubes
Upper Core Barrel	Jet Pump Assemblies
Upper Core Grid Plate	Top Fuel Guide
Guide Tubes	Core Support Plate
Lower Core Barrel	Core Shroud
Thermal Shields	Reactor Vessel Wall
Core Shroud	Sacrificial Shield
Lower Grid Plate	Reactor Water Recirculation
Lower Support Column	Other Primary Containment
Lower Core Forging	Containment Atmospheric Control
Miscellaneous Internals	High Pressure Core Spray
Biological Shield Concrete	Low Pressure Core Spray
Reactor Cavity Liner	Reactor Building Closed Cooling
Reactor Coolant Pumps	Reactor Core Isolation Cooling
Pressurizer	Residual Heat Removal
Heat Exchangers, Sump Pump, Cavity Pump	Pool Liner & Racks
Pressurizer Relief Tank	Contaminated Concrete
Safety Injection Accumulator Tanks	Other Reactor Building
Steam Generators	Turbine
Reactor Coolant Piping	Nuclear Steam Condensate
Other Containment Building	Low Pressure Feedwater Heaters
Other Buildings	Main Steam
Filter Cartridges	Moisture Separator Reheaters
Spent Resins	Reactor Feedwater Pumps
Combustible Wastes	High Pressure Feedwater Heaters
Evaporator Bottoms	Other Turbine-Generator Building
Post-TMI-2 Additions	Radwaste and Control Building
	Concentrator Bottoms
	Decontamination Solutions, Filter Sludges, & Spent Resins
	Post-TMI-2 Additions

2 **3.4 Sample Calculations of Estimated Reactor Decommissioning Costs**

3 Four sample calculations are provided in this section to demonstrate the use of the
4 decommissioning cost equation developed above using the appropriate adjustment factors of L_x for
5 labor, material, and services; E_x for energy and waste transportation; and B_x for radioactive waste
6 burial/disposition. The coefficients A, B, and C (0.65 coefficient for labor, 0.13 coefficient for energy,
7 and 0.22 coefficient for LLW burial) used in the examples are developed in Table 3-1. Waste
8 generators with no LLW disposal site availability should use the B_x values for the generic LLW
9 disposal site option (i.e., the column titled " B_x Values for Generators Located in the 10 Unaffiliated

- 1 States and for those Located in Compact-Affiliated States having no Disposal Facility,” in Table 2-1).
2 Sample decommissioning costs for other years are provided in 0.

3 **Example 1 (Compact-Affiliated Disposal Facility Only)**

Scenario Description

Reactor Type: BWR
Thermal Power Rating: 3,400 megawatt thermal (MWth)
Location of Plant: Northwest Compact
LLW Disposition Preference: Compact-Affiliated Disposal Facility Only
LLW Burial Location: Washington

Base Cost (1986 Dollars) = \$135 million [from 10 CFR 50.75(c)(1)]

$L_x = 2.60$ [from Table]

$E_x = 1.632$ [from Section 3.2]

$B_x = 7.290$ [from Table 2-1]

Decommissioning Cost (2016 dollars)
 $= (\$135 \text{ million}) * [(0.65) * (2.60) + (0.13) * (1.632) + (0.22) * (7.290)] = \473 million

4

5 **Example 2 (Compact-Affiliated Disposal Facility Only)**

Scenario Description

Reactor Type: PWR
Thermal Power Rating: 3,400 MWth
Location of Plant: Atlantic Compact
LLW Disposition Preference: Compact-Affiliated Disposal Facility Only
LLW Burial Location: South Carolina (Atlantic Compact)

Base Cost (1986 Dollars) = \$105 million [from 10 CFR 50.75(c)(1)]

$L_x = 2.75$ [from Table]

$E_x = 1.645$ [from Section 3.2]

$B_x = 30.061$ [from Table 2-1]

Decommissioning Cost (2016 dollars)
 $= (\$105 \text{ million}) * [(0.65) * (2.75) + (0.13) * (1.645) + (0.22) * (30.061)] = \905 million

6

7

1 **Example 3 (Combination of Compact-Affiliated and Non-Compact Disposal Facilities)**

Scenario Description

Reactor Type: PWR
Thermal Power Rating: 3,400 MWth
Location of Plant: Atlantic Compact
LLW Disposition Preference: Combination of Compact-Affiliated and Non-Compact Disposal Facilities
LLW Burial Location: South Carolina (Atlantic Compact)

Base Cost (1986 Dollars) = \$105 million [from 10 CFR 50.75(c)(1)]

$L_x = 2.75$ [from Table]

$E_x = 1.645$ [from Section 3.2]

$B_x = 10.971$ [from Table 2-1]

Decommissioning Cost (2016 dollars)
= (\$105 million)*[(0.65)*(2.75)+(0.13)*(1.645)+(0.22)*(10.971)]
= \$464 million²

2 **Example 4 (Non-Compact Disposal Facilities)**

Scenario Description

Reactor Type: BWR
Thermal Power Rating: 3,400 MWth
Location of Plant: Midwest Compact
LLW Disposition Preference: Non-Compact Disposal Facilities
LLW Burial Location: Non-Compact Disposal Sites

Base Cost (1986 Dollars) = \$135 million [from 10 CFR 50.75(c)(1)]

$L_x = 2.57$ [from Table]

$E_x = 1.632$ [from Section 3.2]

$B_x = 13.132$ [from Table 2-1]

Decommissioning Cost (2016 dollars)
= (\$135 million)*[(0.65)*(2.57)+(0.13)*(1.632)+(0.22)*(13.132)]
= \$644 million

3

² Examples 2 and 3 are provided to illustrate the significant difference in cost if 1) disposal of all LLW from decommissioning is disposed of at the Atlantic Compact disposal facility located in South Carolina (Example 2, $B_x = 30.061$) and 2) if disposal of Class A LLW is disposed of at the disposal facility located in Utah and the Class B/C LLW is disposed of at the Atlantic Compact disposal facility (Example 3, $B_x = 10.971$). LLW generators located in the Atlantic Compact are not required to dispose of their LLW at the Atlantic Compact disposal facility, hence, it is assumed that these generators will dispose of their Class A LLW at the lower cost Utah disposal facility (Example 3). However, disposal of all LLW generated within the Atlantic Compact can be disposed of at the Atlantic Compact disposal facility, hence, this option is also assumed to be an available option to generators within the Atlantic Compact.

4 REFERENCES

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APPENDIX A

**LOW-LEVEL WASTE BURIAL/DISPOSITION
PRICES FOR THE CURRENT YEAR**

APPENDIX A

LOW LEVEL WASTE BURIAL/DISPOSITION PRICES FOR THE CURRENT YEAR

This appendix contains the price schedules for burial/disposition of LLW at the Washington and South Carolina sites for the year 2016. Also provided is a price quote for the non-compact disposal facility located in Clive, Utah. These schedules are used to calculate the burial/disposition costs discussed in 0.

A.1 Washington LLW Disposal Site

Beginning in 1993, the Northwest Compact imposed on eligible (Northwest or Rocky Mountain Compact) waste generators an annual permit fee based on the volume of waste to be shipped to the Washington site for disposal. For 2016, the permit fees range from \$424 to \$42,400. Hospitals, universities, research centers, and industries pay the lower fees; NPPs pay the highest fee of \$42,400. Permit fees for NPPs are included in this analysis for the years 1993 and later.

Beginning in 1994, the rate schedule for handling and disposing of heavy objects (greater than 5,000 pounds) at the Washington site was revised to recover additional crane rental costs from the waste generator. In 1996, the heavy object limit was raised to 17,500 pounds. A series of shipments of heavy objects for disposal was assumed that would minimize the crane surcharge and result in a one-time only heavy object charge.

Effective January 1, 1996, the operator of the Washington site implemented a restructured rate schedule based on waste volume, number of shipments, number of containers, and dose rate at the container surface. Each waste generator also is assessed an annual site availability charge based on cumulative volume and dose rate at the surface of all containers disposed. The site availability charge appears near the bottom of Tables B-1 through B-12.

The 2008 rate schedule reflects increases in volume (14 percent), shipment (22 percent), and container (17 percent) charges compared to 2006. In addition, dose rate charges per container increased by a factor of 2.8. As a result of these changes, the cost to disposition a PWR increased moderately to 21 percent. However, the cost to disposition a BWR, with its larger volume of high dose rate material, almost doubled.

In 2010, two algorithm changes were implemented to project more accurately charges for waste generated from the decommissioning of an NPP. The first was a discount to the volume disposal rate of 20 percent for LLW generated from the decommissioning of NPPs. The second was to cap the container dose rate charge. According to the settlement agreement between U.S. Ecology Washington, Inc., the operator of the Washington disposal facility, and the State of Washington, only 14.2 percent of the Washington site's revenue requirement (which changes annually) may be recouped from container dose rate charges.

Compared with the 2012 rate schedule used in Revision 15 of NUREG-1307, the 2016 schedule reflects decreases in volume (1 percent) and shipment (2 percent) charges and an increase in container (3 percent) charges. In addition, dose rate charges per container decreased by a factor of 3.9 and site surveillance fee per cubic foot increased by a factor of 2.9. As a result of these rate changes, the cost to disposition the LLW from a PWR increased by 8.4 percent and

the cost to disposition the LLW from a BWR increased by 7.6 percent. The rate schedule for the Washington LLW disposal site, effective May 1, 2016, is presented in Exhibit A-1. Based on other factors, as discussed in Section 3.0, the net cost to disposition the LLW is further increased to 18.7 percent for a PWR and 8.7 percent for a BWR as compared to the 2012 costs.

A.2 South Carolina LLW Disposal Site

Access to the South Carolina site by waste generators outside the Southeast Compact ended June 30, 1994, with site closure scheduled for December 31, 1995. However, effective July 1, 1995, the scheduled closure was canceled and access to the Barnwell facility was extended to all states except North Carolina. In June 2000, prohibition on waste from North Carolina was lifted.

Effective November 1, 1996, the operator of the South Carolina disposal site implemented a restructured waste disposal rate schedule. The restructured pricing is based on weight, dose rate, and curies with a cost incentive toward higher density packaging. All business after November 1, 1996, is through customer-specific contracts.

In the years between 2001 and 2008, the maximum allowable volume of LLW disposed of at the South Carolina LLW disposal site from all sources was governed by a schedule contained in the Atlantic Interstate Low-Level Radioactive Waste Compact Implementation Act, which was enacted into law July 1, 2000. This schedule is shown in Table A-1.

Table A-1 Schedule of Maximum Allowable LLW Disposal at the South Carolina Disposal Facility(a)

Fiscal Year	Maximum Allowable LLW Volume from All Sources (ft³)
2001	160,000
2002	80,000
2003	70,000
2004	60,000
2005	50,000
2006	45,000
2007	40,000
2008	35,000

(a) Reference: Code of Laws of South Carolina, 1976, Section 1, Title 48, Chapter 46.

Effective July 1, 2008, out-of-compact waste was prohibited from disposal at the South Carolina disposal site.

Weight charges, curie surcharges, and irradiated hardware charges all increased approximately 1 percent from the 2012 Atlantic Compact rates, while dose rate and administrative surcharge remained constant. As a result of these changes, the cost to disposition the LLW from both a BWR and a PWR increased approximately 1 percent. The rate schedule for the South Carolina LLW disposal site, effective July 1, 2016, is presented in Exhibit A-2. Based on other factors, as discussed in Section 3.0, the net cost to disposition the LLW decreased by 1.7 percent for a PWR and 3.5 percent for a BWR as compared to the 2012 costs.

A.3 Texas LLW Disposal Site

Beginning in the Spring of 2012, a new disposal facility located in Andrews County, Texas became available for disposal of LLW from States within the Texas Compact (comprised of Texas and Vermont). The Andrews County, Texas, facility, or Texas Compact Waste Facility (CWF), also accepts LLW from out-of-compact generators. The fees for LLW disposal are determined by the Texas Commission on Environmental Quality (TCEQ). Out-of-compact generators, however, must submit an import petition to the Texas Compact Commission for approval prior to shipping. The State of Texas also limits total non-compact waste disposed at the CWF to 30-percent of licensed capacity and charges additional fees for out-of-compact LLW.

The current approved rate schedule for disposal of LLW at the CWF is provided in Section 336.1310 (Subchapter N) of Title 30 of the Texas Administrative Code (TAC). This rate schedule is provided in Exhibit A-3. The fees in this exhibit are the maximum disposal rates that can be charged to in-compact generators. Fees charged to out-of-compact generators must be greater than these rates. Various established Texas fees charged to out-of-compact LLW currently amounts to an additional 31.25-percent on top of the rates shown in Exhibit A-3. In addition, it is assumed that an additional 20-percent in fees/taxes is charged for out-of-compact LLW.

A.4 Alternative LLW Disposal Options

In the 1990s rapidly increasing fees for disposal of low-level radioactive waste spawned the creation of a niche market for firms specializing in the management and disposal of LLW. Increasingly, NPP licensees began to outsource LLW management functions to waste vendors for a negotiated fee (usually \$/pound of LLW processed) and disposing of Class A LLW at the non-compact disposal facility in Clive, Utah. Waste vendors could manage waste from generation to disposal (including packaging, transportation, and volume reduction) or any subset of these functions that the licensee desired.

The vendor determined the most efficient disposition process for each waste stream. These take into consideration sorting into clean and contaminated streams, recycling where possible, volume reduction through the many techniques currently commercially available, and disposal of the residual LLW at the most cost-effective disposal site; including the non-compact disposal facility located in Clive, Utah. The vendor's profit was the difference between the price negotiated with the licensee and the total cost for waste minimization, recycling, volume reduction, packaging, transportation, and disposal. The more effective the vendor was at minimization, recycling, volume reduction, and obtaining volume discounts for packaging, transportation, and disposal, the greater its profit.

The decommissioning analyses reported in NUREG/CR-0130 and NUREG/CR-0672 did not consider the possible use of waste vendors or non-compact Class A, LLW disposal facilities, given that these market niches essentially did not exist at the time. Beginning with Revision 8, NUREG-1307 included an alternative that provided for contracting with waste vendors to manage the disposition the bulk of LLW generated during decommissioning. This new alternative did not modify or alter in any way the bases for the decommissioning fund requirement specified in 10 CFR 50.75, "Reporting and Recordkeeping for Decommissioning Planning." It merely provided an alternative burial cost adjustment factor (B_x) that reflected the option of disposing of LLW using a combination of waste vendors, non-compact disposal facilities and compact-affiliated disposal facilities.

1 In support of the analysis performed for NUREG-1307, Revision 8 (Ref. 3), several waste
2 vendors were surveyed to develop a representative cost for waste vendor services. Each
3 vendor was asked to provide a generic price quote for processing two waste streams: activated
4 and contaminated concrete and contaminated metal. Vendors were asked to provide these
5 quotes as a price per pound of waste, or as a range of prices per pound, based on the waste
6 concrete and metal inventories in NUREG/CR-0130 and NUREG/CR-0672. The price quotes
7 were to encompass complete disposition of these waste streams (from generation to disposal)
8 and to be developed assuming the vendor had a contract with a licensee engaged in a large
9 decommissioning project.

10 Based on the results of the survey, NUREG-1307, Revision 8, introduced an alternative burial
11 cost adjustment factor (B_x) that assumed the use of waste vendor services and disposal of
12 Class A LLW at the non-compact disposal facility located in Clive, Utah as an alternative to
13 disposal of all decommissioning LLW at a compact-affiliated disposal facility. The option was
14 introduced to provide potential savings from the use of waste vendors. For a PWR under this
15 option, 98-percent of the waste was assumed to be dispositioned by waste vendors and the
16 remaining 2-percent was assumed to be disposed of at a compact-affiliated disposal facility.
17 For a BWR under this option, 96-percent of the waste was assumed to be dispositioned by
18 waste vendors and the remaining 4-percent was assumed to be disposed of at a compact-
19 affiliated disposal facility. These proportions were determined from a component-by-component
20 analysis of the reference BWR and PWR. The portions of waste assumed to be dispositioned by
21 waste vendors were priced at the rates obtained from the vendor surveys, and the portions of
22 waste assumed to be disposed of at compact-affiliated disposal facilities were priced at rates
23 obtained for those facilities.

24 In support of Revision 16 of NUREG-1307, a similar survey was conducted. In response to this
25 survey, a price quote to disposition the components of the reference PWR and BWR at the Utah
26 disposal facility was obtained. Unit costs, exclusive of taxes, were provided for several different
27 categories of components, which are provided in **Error! Reference source not found.** The
28 updated rates represent an average increase of 8.3 percent, with the exception of evaporator
29 bottoms which increased by approximately 78.5 percent, compared to the 2012 rates. These
30 rates assume no volume discounts, which can be substantial. The development of the B_x factor
31 for the "Combination of Compact-Affiliated and Non-Compact Disposal Facilities" option and the
32 "Non-Compact Disposal Facilities" option was based on these rates and an assumed 10 percent
33 tax.
34

1 **Table A-2 Price Quotes for Disposition of Class A LLW at the Non-Compact Disposal**
 2 **Facility Located in Clive, Utah**

Component Class	Cost	Per Unit
Large Components	\$379	ft ³
Debris	\$157	ft ³
Oversize Debris	\$179	ft ³
Resins/Filters	\$498	ft ³
Combustibles	\$622	ft ³
Evaporator Bottoms	\$25	gal

3

1 **Exhibit A-1**

2
3 U.S. ECOLOGY WASHINGTON, INC.
4 RICHLAND, WASHINGTON FACILITY
5 RADIOACTIVE WASTE DISPOSAL
6

7 **SCHEDULE OF CHARGES**
8 **EFFECTIVE MAY 1, 2016**
9 **SCHEDULE A, 16th REVISION**

10 Note: Rates in this Schedule A are subject to adjustment in accordance with the rate
11 adjustment mechanism adopted in the Washington Utilities and Transportation Commission's
12 Sixth Supplemental Order in Docket No. UR-950619 as extended by Commission Order in
13 Docket Nos. UR-010623 and UR-010706, and TL-070848.
14

15 A. **SITE AVAILABILITY CHARGE**

16 1. Rates
17
18

<u>Block</u>	<u>Block Criteria</u>	<u>Annual Charge per Generator</u>
0	No site use at all	\$282
1	Greater than zero but less than or equal to 10 ft ³ and 50 mR/h	539
2	Greater than 10 ft ³ or 50 mR/h* but less than or equal to 20 ft ³ and 100 mR/h*	1,035
3	Greater than 20 ft ³ or 100 mR/h* but less than or equal to 40 ft ³ and 200 mR/h*	1,986
4	Greater than 40 ft ³ or 200 mR/h* but less than or equal to 80 ft ³ and 400 mR/h*	3,813
5	Greater than 80 ft ³ or 400 mR/h* but less than or equal to 160 ft ³ and 800 mR/h*	7,323
6	Greater than 160 ft ³ or 800 mR/h* but less than or equal to 320 ft ³ and 1,600 mR/h*	14,045
7	Greater than 320 ft ³ or 1,600 mR/h* but less than or equal to 640 ft ³ and 3,200 mR/h*	26,968
8	Greater than 640 ft ³ or 3,200 mR/h* but less than or equal to 1,280 ft ³ and 6,400 mR/h*	51,771
9	Greater than 1,280 ft ³ or 6,400 mR/h* but less than or equal to 2,560 ft ³ and 12,800 mR/h*	99,399
10	Greater than 2,560 ft ³ or 12,800 mR/h* but less than or equal to 5,120 ft ³ and 25,600 mR/h*	140,839
11	Greater than 5,120 ft ³ or 25,600 mR/h*	140,839

* For purposes of determining the site availability charge, mR/hour is calculated by summing the mR per hour at container surface of all containers received during the year.

19 2. Exemptions
20
21

- 22 a. As to waste which is generated by educational research institutions for research, medical
23 or educational purposes, such institutions shall be placed in a rate block for the site
24 availability charge which is one (1) lower than what would otherwise apply through
25 application of the block criteria shown above. "Educational research Institution" means a
26 state or independent, not-for-profit, post-secondary educational institution.
27
28 b. As to waste which arises as residual or secondary waste from brokers' provision of
29 compaction or processing services for others, if application of the block criteria shown
30 above would place a broker in a rate block for the site availability charge which is greater
31 than Block No. 7, such broker shall be placed in the rate block which is the greater of (i)
32 Block No. 7, or (ii) the block which is two (2) lower than what would otherwise apply
33 through application of the block criteria shown above. "Brokers" are those customers
34 holding the "broker" classification of site use permits issued by the Department of Health.

35 3. Payment Arrangements
36

37 a. Initial Determination
38

39 Initial determination as to the applicable rate block for each customer shall be based on
40 projections provided by customers prior to the beginning of each calendar year. For

1 those customers who do not intend to ship waste to the facility during the calendar year
2 (those assigned to block No. 0) and for those customers who are initially determined to
3 fall into block Nos. 1–2, the entire site availability charge for the year will be due and
4 payable as of January 1. For those customers who are initially determined to fall into
5 block Nos. 3–8, the entire site availability charge will also be due and payable as of
6 January 1, although those customers may make special arrangements with the Company
7 to pay the charge in equal installments at the beginning of each calendar quarter. For
8 those generators who are initially determined to fall in block Nos. 9-11, 1/12 of the site
9 availability charge will be due and payable as of the beginning of each calendar month.
10 These customers may pay in advance if they wish.

11
12 b. Reconciliation

13
14 The site availability charge is assessed on the basis of actual volume and dose rate of waste
15 delivered during the calendar year. Assessment of additional amounts, or refunds of
16 overpaid amounts, will be made as appropriate to reconcile the initial determination regarding
17 applicable rate block with the actual volume and dose rates during the calendar year.
18

Exhibit A-1

SCHEDULE A (Continued)

B. DISPOSAL RATES

1. Volume: \$114.00 per cubic foot
2. Shipment: \$13,510 per manifested shipment
3. Container: \$7,790 per container on each manifest.
4. Exposure:

Block No.	Dose Rate at Container Surface	Charge per Container
1	Less than or equal to 200 mR/h	\$24
2	Greater than 200 mR/h but less than or equal to 1,000 mR/h	1,706
3	Greater than 1,000 mR/h but less than or equal to 10,000 mR/h	6,750
4	Greater than 10,000 mR/h but less than or equal to 100,000 mR/h	10,050
5	Greater than 100,000 mR/h	169,300

EXTRAORDINARY VOLUMES

Waste shipments qualifying as an "extraordinary volume" under RCW 81.108.020(3) are charged a rate equal to 51.5 percent of the volume disposal rate.

NUCLEAR DECOMMISSIONING WASTE

The volume disposal rate applicable to waste from the decommissioning of nuclear generating units shall be 80 percent of those set forth above; provided, however, that such waste must satisfy the quantity requirements for "extraordinary volume" under RCW 81.108.020¹.

**SCHEDULE B
Surcharges and Other Special Charges
Eighth Revision**

ENGINEERED CONCRETE BARRIERS

72" x 8' barrier	\$12,549.00 each
84" x 8' barrier	\$13,779.00 each

SURCHARGE FOR HEAVY OBJECTS

¹ Revised Code of Washington (RCW) 81.108.020(3) - "Extraordinary volume" means volumes of low-level radioactive waste delivered to a site caused by nonrecurring events, outside normal operations of a generator, that are in excess of twenty thousand cubic feet or twenty percent of the preceding year's total volume at such site, whichever is less.

1 The Company shall collect its actual labor and equipment costs incurred, plus a margin thereon of 25
2 percent, in handling and disposing of objects or packages weighing more than seventeen thousand five
3 hundred (17,500) pounds.

4
5 SCHEDULE C
6 Tax and Fee Rider
7 Original Tariff
8

9 The rates and charges set forth in Schedules A and B shall be increased by the amount of any fee,
10 surcharge, or tax assessed on a volume or gross revenue basis against or collected by U.S. Ecology
11 Washington, Inc. as listed below:

12		
13	Perpetual Care and Maintenance Fees	\$1.75 per cubic foot
14	Business & Occupation Tax	3.3 percent of rates and charges
15	Site Surveillance Fee	\$26.00 per cubic foot
16	Surcharge (RCW 43.200.233)	\$6.50 per cubic foot
17	Commission Regulatory Fee	1.0 percent of rates and charges
18		

1 **Exhibit A-2**

2
3 **Pursuant to 48-46-40(A)(2), S.C.C.**

4
5 **Uniform Schedule of Maximum Disposal Rates**
6 **for Atlantic Compact Regional Waste**

7
8 **EFFECTIVE JULY 1, 2016**

9
10 The Uniform Schedule of Maximum Disposal Rates for Atlantic Compact Regional Waste is a permanent
11 ceiling on disposal rates applicable to Atlantic Compact waste that is adjusted each year in accordance
12 with the Producer Price Index. South Carolina may charge Atlantic Compact generators less than the
13 Uniform Maximum Schedule, but cannot charge regional generators more than this rate.

14
15 **THE MINIMUM CHARGE PER SHIPMENT, EXCLUDING SURCHARGES AND SPECIFIC OTHER**
16 **CHARGES, IS \$1,000.00**

17
18 **1. WEIGHT CHARGES (not including surcharges)**

19
20 **A. Base weight charge**

21 **Density Range**

- 22 i) Equal to or greater than 120 lbs./ft³
23 ii) Equal to or greater than 75 lbs./ft³ and less than 120 lbs./ft³
24 iii) Equal to or greater than 60 lbs./ft³ and less than 75 lbs./ft³
25 iv) Equal to or greater than 45 lbs./ft³ and less than 60 lbs./ft³
26 v) Less than 45 lbs./ft³

Weight Rate

\$7.589 per pound
\$8.348 per pound
\$10.246 per pound
\$13.283 per pound
\$13.283 per pound
multiplied by: (45 ÷
pounds per cubic foot
of the package)

27
28
29
30
31 **B. Dose multiplier on base weight charge**

32 **Container Dose Level**

Multiplier on Weight Rate, above

33 0 mR/hr - 200 mR/hr	1.00
34 >200 mR/hr - 1 R/hr	1.08
35 >1R/hr - 2R/hr	1.12
36 >2R/hr - 3R/hr	1.17
37 >3R/hr - 4R/hr	1.22
38 >4R/hr - 5R/hr	1.27
39 >5R/hr - 10R/hr	1.32
40 >10R/hr - 25R/hr	1.37
41 >25R/hr - 50R/hr	1.42
42 >50R/hr	1.48

43
44 **C. Biological Waste:** Add \$1.705 per pound to rate calculated above

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*In lieu of above, generator may opt for an alternative millicurie charge of \$1.135 per millicurie applicable only to millicuries with greater than 5-year half-life. Such election must be provided in writing to the disposal site operator prior to July 1, 2015.

B.	Irradiated hardware charges	\$86,253 per shipment
	(See Note B under Miscellaneous)	

D.	Atlantic Compact Commission administrative surcharge	\$6.00 per cubic foot (Subject to change during year)
----	--	--

Exhibit A-2

NOTES

- A. Surcharges for the Barnwell Extended Care Fund and the Decommissioning Trust Fund are included in the rates.
- B. Irradiated hardware: As a general rule, billing as irradiated hardware pertains to shipments of exceptionally high activity that require clearing of the site and special off-loading into a slit trench. These generally include TN-RAM² and other horizontally offloaded cask shipments. In addition to items of irradiated hardware, shipments considered irradiated hardware, for purposes of disposal, have included certain sealed sources and materials with exceptionally high levels of radioactivity.
- C. Large components (e.g., steam generators, reactor pressure vessels, coolant pumps). Disposal fees for large components (e.g., steam generators, reactor pressure vessels, reactor coolant pumps, or items that will not fit into standard sized disposal vaults) are based on the generally applicable rates, in their entirety, except that the weight and volume used to determine density and weight related charges is calculated as follows:
1. For packages where the large component shell qualifies as the disposal vault per Department of Health and Environmental Control (DHEC) regulations, weight and volume calculations are based on all sub-components and material contained within the inside surface of the large component shell, including all internals and any stabilization media injected by the shipper, but excluding the shell itself and all incidental external attachments required for shipping and handling; and
 2. For packages with a separate shipping container that qualifies as the disposal vault per DHEC regulations, weight and volume calculations are based on the large component, all sub-components, and material contained within the inside surface of the shipping container, including any stabilization media injected by the shipper (including that between the large component and the shipping container), but excluding the shipping container itself and all incidental external attachments required for shipping and handling.
- D. Co-mingled shipments from brokers and processors: For containers that include waste from different generators (DHEC permittees), the weight and density of the waste from each generator will be assessed separately for purposes of the weight charge in I.A. The dose of the container as a whole will be used to assess the dose multiplier in I.B. The millicurie charge 2.A. above, applies individually to each portion of waste in the shipment from each generator. The disposal site operator will provide guidelines for application of this method.
- E. Transport vehicles with additional shielding features may be subject to an additional handling fee, which will be provided upon request.

² TN-RAM is a radioactive material cask used to transport irradiated non-fuel bearing solid materials.

- 1 F. In certain circumstances, the disposal site operator may assess additional charges for necessary
2 services that are not part of and are additional to disposal rates established by the State of South
3 Carolina. These include decontamination services and special services as described in the
4 Barnwell Site Disposal Criteria.
- 5 G. The disposal site operator has established the following policies and procedures, which are
6 provided herein for informational purposes:
- 7 i. Terms of payment are net 30 days upon presentation of invoices. A per-month service
8 charge of one and one-half percent (1.5 percent) shall be levied on accounts not paid
9 within thirty (30) days.
- 10 ii. Company purchase orders or a written letter of authorization and substance acceptable
11 to Chem-Nuclear Systems, L.L.C. (CNS) shall be received before receipt of radioactive
12 waste material at the Barnwell Site and shall refer to CNS Radioactive Material License,
13 the Barnwell Site Disposal Criteria, and subsequent changes thereto.
- 14 iii. All shipments shall receive a CNS shipment identification number and conform to the
15 Prior Notification Plan.
- 16

Exhibit A-3

Texas Commission on Environmental Quality

Chapter 336 – Radioactive Substance Rules

SSUBCHAPTER N: FEES FOR LOW-LEVEL RADIOACTIVE WASTE DISPOSAL

EFFECTIVE FEBRUARY 26, 2015

§336.1310. Rate Schedule.

Fees charged for disposal of party-state compact waste must be equal to or less than the compact waste disposal fees under this section. Additionally, fees charged for disposal of nonparty compact waste must be greater than the compact waste disposal fees under this section.

Figure: 30 TAC §336.1310³

Disposal Rate for the Compact Waste Disposal Facility

1. Base Disposal Charge:

	Charge per cubic foot
Class A LLW - Routine	\$100
Class A LLW - Shielded	\$180
Class B and C LLW	\$1,000
Sources	\$500
Biological Waste (Untreated)	\$350

1B. Radioactivity Charge	
Curie Inventory Charge (\$/mCi)	\$0.55
Maximum Curie Charge (per shipment) (excluding C-14)	\$220,000/shipment
Carbon-14 Inventory Charge (\$/mCi)	\$1.00
Special Nuclear Material Charge (\$/gram)	\$100

³ The Texas Administrative Code (TAC) Title 30, Part 1, Chapter 336, Subchapter N, Rule §336.1310 is available at: [https://texreg.sos.state.tx.us/public/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=1310](https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=1310)

1 2. Surcharges to the Base Disposal Charge:

2A. Weight Surcharge - Weight (lbs.) of Container	Surcharge (\$/container)
10,000 to 50,000 lbs	\$10,000
Greater than 50,000 lbs	\$20,000

2

2B. Dose Rate Surcharge - Surface Dose Rate (R/hour) of Container	Surcharge per cubic foot
1-5 R/hour	\$100
Greater than 5 to 50 R/hour	\$200
Greater than 50 to 100 R/hour	\$300
Greater than 100 R/hour	\$400

3

2C. Irradiated Hardware Surcharge	
Surcharge for special handling per shipment	\$75,000/shipment

4

2D. Cask (Shielding Waste) Surcharge	
Cask handling surcharge per cask	\$2,500/cask

5

6 Adopted February 4, 2015

Effective February 26, 2015

APPENDIX B

CALCULATION OF LOW-LEVEL WASTE BURIAL/DISPOSITION COST ESTIMATION FACTORS

APPENDIX B

CALCULATION OF LOW-LEVEL WASTE BURIAL/DISPOSITION COST ESTIMATION FACTORS

The calculations necessary to determine the costs for burial/disposition of radioactive wastes resulting from decommissioning the reference PWR and the reference BWR are performed using spreadsheet models. The spreadsheets evaluate the burial/disposition costs for each of the items originally budgeted in the PWR and BWR decommissioning studies and in Addendums 4 and 3 (Refs. 1, 2), respectively, to those reports. The costs are based on the published price schedules from the compact-affiliated disposal facilities and a price quote from the non-compact disposal facility located in Clive, Utah.

The B_x values reported in this document reflect the updated rate schedules and price quote. All the calculations are based on the same inventory of radioactive wastes as was postulated in the 1986 and 1978–1980 analyses. Starting in 1988, the inventories also included post-Three Mile Island (TMI)-2 contributions from the reference PWR and the reference BWR (Refs. 1, 2).

B.1 Washington LLW Disposal Site

The LLW disposal site located in Washington was used to develop the original decommissioning cost estimates for the reference PWR and the reference BWR. These estimates are the basis for the minimum decommissioning fund requirement specified in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.75(c), which is in 1986 dollars. Thus, $B_x = 1.0/1.0$ (for PWR/BWR) for 1986.

For the year 2016, $B_x = 8.706$ and 7.290 for a PWR and BWR, respectively, at the Washington disposal facility. These B_x values reflect the adjustment in waste burial costs at the Washington LLW disposal site since 1986. B_x values for several previous revisions of NUREG-1307 are summarized in Table 2-1.

Waste burial costs for the year 2016 were developed using the rate schedule provided in Exhibit A-1. The spreadsheet calculations for the current year, which are too voluminous to present here, are summarized in Table B-1 and Table B-2 for PWR and BWR plants, respectively. Table B-3 through Table B-12 provide summaries of the waste burial costs at the Washington LLW disposal site for 2012, 2010, 2008, 2006, and 2004, respectively, for both PWR plants and BWR plants. These estimates originally were reported in previous revisions of NUREG-1307.

B.2 South Carolina LLW Disposal Site

For the year 2016, $B_x = 30.061$ and 26.329 for a PWR and BWR, respectively, at the South Carolina disposal facility. These B_x values reflect the adjustment in waste burial costs at the South Carolina LLW disposal site normalized to the 1986 Washington LLW disposal site burial costs. B_x values for several previous revisions of NUREG-1307 are summarized in Table 2-1.

Waste burial costs for the year 2016 were developed using the rate schedules provided in Exhibit A-2. The spreadsheet calculations for the current year, which are too voluminous to present here, are summarized in Table B-13 and Table B-14 for PWR and BWR plants, respectively. Table B-15 through Table B-24 provide summaries of the waste burial costs at the South Carolina LLW disposal site for 2012, 2010, 2008, 2006, and 2004, respectively, for both

PWR plants and BWR plants. These estimates originally were reported in previous revisions of NUREG-1307.

B.3 Texas LLW Disposal Site

For the year 2016, $B_x = 8.508$ and 8.293 for a PWR and BWR, respectively, at the Texas disposal facility. These B_x values reflect the adjustment in waste burial costs at the Texas LLW disposal site normalized to the 1986 Washington LLW disposal site burial costs.

Waste burial costs for the year 2016 were developed using the rate schedules provided in Exhibit A-3. The spreadsheet calculations for the current year, which are too voluminous to present here, are summarized in Table B-25 and Table B-26 for PWR and BWR plants, respectively.

B.4 Combination of Non-Compact and Compact-Affiliated Disposal Facilities

For the year 2016, $B_x = 8.129$ and 6.668 for a PWR and BWR, respectively, for disposal of most Class A LLW at the Utah non-compact site, and for the remainder of LLW at the Washington LLW disposal site. $B_x = 10.971$ and 12.111 for a PWR and BWR, respectively, for disposal of most Class A LLW at the Utah non-compact site, and for the remainder of LLW at the South Carolina compact-affiliated disposal site. $B_x = 10.672$ and 10.441 for a PWR and BWR, respectively, for disposal of most Class A LLW at the Utah non-compact site, and for the remainder of LLW at the Texas LLW disposal site. B_x values are summarized in Table 2-1.

Waste burial costs for the year 2016 were developed using both the rate schedules for the compact-affiliated disposal facilities provided in Exhibits A-1, A-2, and A-3 and for the price quote for the non-compact disposal facility provided in Table A-2. The spreadsheet calculations for the current year, which are too voluminous to present here, are summarized in Table B-27 through Table B-32 for the Washington, South Carolina, and Texas LLW disposal sites, respectively, for both PWR and BWR plants. Table B-33 through Table B-52 provide summaries of the Washington and South Carolina waste burial/disposition costs for 2012, 2010, 2008, 2006, and 2004, respectively, for both PWR and BWR plants. These estimates were originally reported in previous revisions of NUREG-1307.

B.5 Generators Located in States Not Affiliated with a Compact having a Disposal Facility

Effective with Revision 16, both the Clive, Utah and the Andrews County, Texas disposal facilities are available for the disposal of all LLW regardless of whether a generator has a compact-affiliated disposal facility available for disposal of their LLW or not. The Utah facility can only dispose of Class A LLW, while the Texas facility is a full-service disposal facility and so can dispose of Class A, B, and C LLW (subject to the constraints described in Section A.3). For the year 2016, $B_x = 12.471$ and 13.132 for a PWR and BWR, respectively, for disposal of most Class A LLW at the Utah non-compact site, and for the remainder of LLW at the Texas LLW disposal site. The B_x values include the additional fees imposed for the disposal of non-compact LLW at the Texas disposal facility. The B_x values are summarized in Table 2-1. These B_x values should be used by generators located in States not affiliated with a compact having a disposal facility.

Waste burial costs for the year 2016 were developed using both the rate schedules for the Texas disposal facility provided in Exhibit A-3, and the associated additional fees for out-of-compact waste, and the price quote for the non-compact disposal facility provided in Table A-2.

The spreadsheet calculations for the current year, which are too voluminous to present here, are summarized in Table B-53 and Table B-54 for PWR and BWR plants, respectively.

B.6 Other

As other low-level radioactive waste burial sites come into service in the interstate compacts, values for B_x will be calculated using the price schedules for each of those sites and will be incorporated into subsequent issues of this NUREG. Those materials whose activity concentrations exceed the limits for Class C LLW are identified by footnote as greater-than-Class C (GTCC) material. Because the analyses in this NUREG postulate placing this material in a LLW disposal facility, the disposal costs for this material may be significantly overestimated compared with high-density packaging and geologic repository disposal. It may also be feasible to store GTCC waste in independent spent fuel storage installations (ISFSIs) or other interim storage facilities, as permitted by 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste."

Table B-1 PWR Burial Costs at the Washington Site (2016 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
VESSEL WALL	346,560	513,380	296,020	381,900	1,537,860
VESSEL HEAD & BOTTOM	364,800	540,400	311,600	960	1,217,760
UPPER CORE SUPPORT ASSM	36,480	54,040	31,160	27,000	148,680
UPPER SUPPORT COLUMN	36,480	54,040	31,160	27,000	148,680
UPPER CORE BARREL	18,240	27,020	15,580	20,100	80,940
UPPER CORE GRID PLATE	45,600	67,550	38,950	50,250	202,350
GUIDE TUBES	54,720	81,060	46,740	40,500	223,020
LOWER CORE BARREL ^(a)	291,840	432,320	249,280	321,600	1,295,040
THERMAL SHIELDS ^(a)	54,720	81,060	46,740	60,300	242,820
CORE SHROUD ^(a)	36,480	54,040	31,160	40,200	161,880
LOWER GRID PLATE ^(a)	45,600	67,550	38,950	50,250	202,350
LOWER SUPPORT COLUMN	9,120	13,510	7,790	10,050	40,470
LOWER CORE FORGING	100,320	148,610	85,690	110,550	445,170
MISC INTERNALS	72,960	108,080	62,320	80,400	323,760
BIO SHIELD CONCRETE	2,276,352	661,990	1,519,050	4,680	4,462,072
REACTOR CAVITY LINER	46,694	13,510	31,160	96	91,460
REACTOR COOLANT PUMPS	383,040	162,120	62,320	192	607,672
PRESSURIZER	328,320	108,080	62,320	192	498,912
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	36,480	13,510	23,370	72	73,432
PRESSURIZER RELIEF TANK	109,440	27,020	15,580	48	152,088
SAFETY INJECTION ACCUM TANKS	364,800	108,080	62,320	192	535,392
STEAM GENERATORS	1,948,214	432,320	249,280	768	2,630,582
REACTOR COOLANT PIPING	300,960	94,570	54,530	168	450,228
REMAINING CONTAM. MATLS	4,797,850	1,364,510	3,201,690	9,864	9,373,914
CONTAMINATED MATRL OTHR BLD	43,512,523	10,753,960	28,893,110	89,016	83,248,609
FILTER CARTRIDGES	28,728	81,060	327,180	283,500	720,468
SPENT RESINS	182,400	270,200	155,800	201,000	809,400
COMBUSTIBLE WASTES – CLASS A	636,120	405,300	7,244,700	22,320	8,308,440
COMBUSTIBLE WASTES – CLASS B	287,280	405,300	3,271,800	675,710	4,640,090
EVAPORATOR BOTTOMS	857,280	1,269,940	732,260	0	2,859,480
POST-TMI-2 ADDITIONS	1,418,715	135,100	942,590	0	2,496,405
HEAVY OBJECT SURCHARGE					192,515
SITE AVAILABILITY CHARGES					422,517
SUBTOTAL PWR COSTS	59,029,116	18,549,230	48,142,200	2,508,878	128,844,456
TAXES & FEES (% OF CHARGES)					5,540,312
TAXES & FEES (\$/UNIT VOL.)					22,099,781
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL PWR COSTS					156,611,748

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-2 BWR Burial Costs at the Washington Site (2016 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
STEAM SEPARATOR	32,207	189,140	218,120	836,293	1,275,759
FUEL SUPPORT & PIECES	16,103	94,570	109,060	140,700	360,433
CONTROL RODS/INCORES	48,310	108,080	62,320	836,293	1,055,003
CONTROL RODS GUIDES	12,883	81,060	93,480	120,600	308,023
JET PUMPS	45,090	270,200	311,600	574,993	1,201,882
TOP FUEL GUIDES	77,297	972,720	560,880	0	1,610,897
CORE SUPPORT PLATE	35,428	216,160	241,490	0	493,078
CORE SHROUD ^(a)	151,373	1,891,400	1,090,600	0	3,133,373
REACTOR VESSEL WALL	25,766	270,200	171,380	0	467,346
SAC SHIELD Neutron-Activated Matl	289,862	189,140	109,060	0	588,062
REACT. WATER REC	283,421	67,550	46,740	0	397,711
SAC SHIELD Contaminated Matl	998,414	513,380	296,020	0	1,807,814
OTHER PRIMARY CONTAINMENT	11,388,365	2,296,700	7,556,300	0	21,241,365
CONTAINM. ATMOSPHERIC	154,593	13,510	15,580	0	183,683
HIGH PRESSURE CORE SPRAY	54,752	27,020	15,580	0	97,352
LOW PRESSURE CORE SPRAY	32,207	13,510	7,790	0	53,507
REACTOR BLDG CLOSED COOLING	103,062	27,020	46,740	0	176,822
REACTOR CORE ISO COOLING	41,869	13,510	23,370	0	78,749
RESIDUAL HEAT REMOVAL	199,683	67,550	54,530	0	321,763
POOL LINER & RACKS	1,227,083	243,180	288,230	0	1,758,493
CONTAMINATED CONCRETE	1,397,780	378,280	841,320	0	2,617,380
OTHER REACTOR BUILDING	4,570,161	621,460	3,038,100	0	8,229,721
TURBINE	4,528,292	1,107,820	2,165,620	0	7,801,732
NUCLEAR STEAM CONDENSATE	1,169,111	175,630	342,760	0	1,687,501
LOW PRESSURE FEEDWATER HEATERS	2,373,650	567,420	342,760	0	3,283,830
MAIN STEAM	228,669	27,020	23,370	0	279,059
MOISTURE SEPARATOR REHEATERS	2,302,794	351,260	202,540	0	2,856,594
REACTOR FEEDWATER PUMPS	624,814	81,060	155,800	0	861,674
HIGH PRESSURE FEEDWATER HEATERS	389,704	108,080	62,320	0	560,104
OTHER TG BLDG	15,642,899	3,215,380	10,002,360	0	28,860,639
RAD WASTE BLDG	7,745,763	972,720	5,001,180	0	13,719,663
REACTOR BLDG – CLASS A	666,200	81,060	7,673,150	0	8,420,410
REACTOR BLDG – CLASS B	299,621	432,320	3,450,970	0	4,182,911
TG BLDG – CLASS A	449,770	54,040	5,180,350	0	5,684,160
TG BLDG – CLASS B	202,227	283,710	2,329,210	0	2,815,147
RAD WASTE & CONTROL – CLASS A	388,222	54,040	4,471,460	0	4,913,722
RAD WASTE & CONTROL – CLASS B	174,497	256,690	2,009,820	0	2,441,007
CONCENTRATOR BOTTOMS – CLASS A	1,584,580	2,337,230	1,347,670	0	5,269,480
CONCENTRATOR BOTTOMS – CLASS B	476,662	702,520	405,080	0	1,584,262
OTHER	560,400	824,110	475,190	0	1,859,700
POST-TMI-2 ADDITIONS	115,945	13,510	109,060	0	238,515
HEAVY OBJECT SURCHARGE					278,732
SITE AVAILABILITY CHARGES					422,517
SUBTOTAL BWR COSTS	61,109,530	20,210,960	60,948,960	2,508,878	145,479,577
TAXES & FEES (% OF CHARGES)					6,255,622
TAXES & FEES (\$/UNIT VOL.)					22,949,577
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL BWR COSTS					174,811,975

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-3 PWR Burial Costs at the Washington Site (2012 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
VESSEL WALL	351,120	522,500	287,280	777,649	1,938,549
VESSEL HEAD & BOTTOM	369,600	550,000	302,400	0	1,222,000
UPPER CORE SUPPORT ASSM	36,960	55,000	30,240	0	122,200
UPPER SUPPORT COLUMN	36,960	55,000	30,240	0	122,200
UPPER CORE BARREL	18,480	27,500	15,120	0	61,100
UPPER CORE GRID PLATE	46,200	68,750	37,800	0	152,750
GUIDE TUBES	55,440	82,500	45,360	0	183,300
LOWER CORE BARREL ^(a)	295,680	440,000	241,920	0	977,600
THERMAL SHIELDS ^(a)	55,440	82,500	45,360	0	183,300
CORE SHROUD ^(a)	36,960	55,000	30,240	0	122,200
LOWER GRID PLATE ^(a)	46,200	68,750	37,800	0	152,750
LOWER SUPPORT COLUMN	9,240	13,750	7,560	0	30,550
LOWER CORE FORGING	101,640	151,250	83,160	0	336,050
MISC INTERNALS	73,920	110,000	60,480	0	244,400
BIO SHIELD CONCRETE	2,306,304	673,750	1,474,200	0	4,454,254
REACTOR CAVITY LINER	47,309	13,750	30,240	0	91,299
REACTOR COOLANT PUMPS	388,080	165,000	90,720	0	643,800
PRESSURIZER	332,640	110,000	60,480	0	503,120
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	36,960	13,750	22,680	0	73,390
PRESSURIZER RELIEF TANK	110,880	27,500	15,120	0	153,500
SAFETY INJECTION ACCUM TANKS	369,600	110,000	60,480	0	540,080
STEAM GENERATORS	1,973,849	440,000	241,920	0	2,655,769
REACTOR COOLANT PIPING	304,920	96,250	52,920	0	454,090
REMAINING CONTAM. MATLS	4,860,979	1,388,750	3,107,160	0	9,356,889
CONTAMINATED MATRL OTHR BLD	44,085,056	10,945,000	28,040,040	0	83,070,096
FILTER CARTRIDGES	29,106	82,500	45,360	0	156,966
SPENT RESINS	184,800	275,000	151,200	0	611,000
COMBUSTIBLE WASTES	935,550	825,000	453,600	0	2,214,150
EVAPORATOR BOTTOMS	868,560	1,292,500	710,640	0	2,871,700
POST-TMI-2 ADDITIONS	1,438,021	0	0	0	1,438,021
HEAVY OBJECT SURCHARGE					171,988
SITE AVAILABILITY CHARGES					399,078
SUBTOTAL PWR COSTS	59,806,454	18,741,250	35,811,720	777,649	115,708,139
TAXES & FEES (% OF CHARGES)					4,975,450
TAXES & FEES (\$/UNIT VOL.)					11,130,666
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL PWR COSTS					131,941,455

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-4 BWR Burial Costs at the Washington Site (2012 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
STEAM SEPARATOR	32,631	192,500	211,680	777,649	1,214,460
FUEL SUPPORT & PIECES	16,315	96,250	105,840	0	218,405
CONTROL RODS/INCORES	48,946	110,000	60,480	0	219,426
CONTROL RODS GUIDES	13,052	82,500	90,720	0	186,272
JET PUMPS	45,683	275,000	302,400	0	623,083
TOP FUEL GUIDES	78,314	990,000	544,320	0	1,612,634
CORE SUPPORT PLATE	35,894	220,000	234,360	0	490,254
CORE SHROUD ^(a)	153,364	1,925,000	1,058,400	0	3,136,764
REACTOR VESSEL WALL	26,105	275,000	166,320	0	467,425
SAC SHIELD Neutron-Activated Matl	293,676	192,500	105,840	0	592,016
REACT. WATER REC	287,150	68,750	45,360	0	401,260
SAC SHIELD Contaminated Matl	1,011,551	522,500	287,280	0	1,821,331
OTHER PRIMARY CONTAINMENT	11,538,212	2,337,500	7,333,200	0	21,208,912
CONTAINM. ATMOSPHERIC	156,627	13,750	15,120	0	185,497
HIGH PRESSURE CORE SPRAY	55,472	27,500	15,120	0	98,092
LOW PRESSURE CORE SPRAY	32,631	13,750	7,560	0	53,941
REACTOR BLDG CLOSED COOLING	104,418	27,500	45,360	0	177,278
REACTOR CORE ISO COOLING	42,420	13,750	22,680	0	78,850
RESIDUAL HEAT REMOVAL	202,310	68,750	52,920	0	323,980
POOL LINER & RACKS	1,243,229	247,500	279,720	0	1,770,449
CONTAMINATED CONCRETE	1,416,172	385,000	816,480	0	2,617,652
OTHER REACTOR BUILDING	4,630,295	632,500	2,948,400	0	8,211,195
TURBINE	4,587,875	1,127,500	2,101,680	0	7,817,055
NUCLEAR STEAM CONDENSATE	1,184,494	178,750	332,640	0	1,695,884
LOW PRESSURE FEEDWATER HEATERS	2,404,882	577,500	332,640	0	3,315,022
MAIN STEAM	231,678	27,500	22,680	0	281,858
MOISTURE SEPARATOR REHEATERS	2,333,094	357,500	196,560	0	2,887,154
REACTOR FEEDWATER PUMPS	633,035	82,500	151,200	0	866,735
HIGH PRESSURE FEEDWATER HEATERS	394,831	110,000	60,480	0	565,311
OTHER TG BLDG	15,848,726	3,272,500	9,707,040	0	28,828,266
RAD WASTE BLDG	7,847,681	990,000	4,853,520	0	13,691,201
REACTOR BLDG	978,921	522,500	10,795,680	0	12,297,101
TG BLDG	662,403	343,750	7,287,840	0	8,293,993
RAD WASTE & CONTROL	571,037	316,250	6,289,920	0	7,177,207
CONCENTRATOR BOTTOMS	2,088,364	3,093,750	1,701,000	0	6,883,114
OTHER	567,774	838,750	461,160	0	1,867,684
POST-TMI-2 ADDITIONS	117,533	0	0	0	117,533
HEAVY OBJECT SURCHARGE					247,650
SITE AVAILABILITY CHARGES					399,078
SUBTOTAL BWR COSTS	61,916,797	20,556,250	59,043,600	777,649	142,941,025
TAXES & FEES (% OF CHARGES)					6,146,464
TAXES & FEES (\$/UNIT VOL.)					11,559,142
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL BWR COSTS					160,773,831

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-5 PWR Burial Costs at the Washington Site (2010 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
VESSEL WALL	386,384	508,060	340,480	277,400	1,512,324
VESSEL HEAD & BOTTOM	406,720	534,800	358,400	680	1,300,600
UPPER CORE SUPPORT ASSM	40,672	53,480	35,840	19,400	149,392
UPPER SUPPORT COLUMN	40,672	53,480	35,840	19,400	149,392
UPPER CORE BARREL	20,336	26,740	17,920	14,600	79,596
UPPER CORE GRID PLATE	50,840	66,850	44,800	36,500	198,990
GUIDE TUBES	61,008	80,220	53,760	29,100	224,088
LOWER CORE BARREL ^(a)	325,376	427,840	286,720	233,600	1,273,536
THERMAL SHIELDS ^(a)	61,008	80,220	53,760	43,800	238,788
CORE SHROUD ^(a)	40,672	53,480	35,840	29,200	159,192
LOWER GRID PLATE ^(a)	50,840	66,850	44,800	36,500	198,990
LOWER SUPPORT COLUMN	10,168	13,370	8,960	7,300	39,798
LOWER CORE FORGING	111,848	147,070	98,560	7,248	364,726
MISC. INTERNALS	81,344	106,960	71,680	0	259,984
BIO SHIELD CONCRETE	2,537,933	655,130	1,747,200	0	4,940,263
REACTOR CAVITY LINER	52,060	13,370	35,840	0	101,270
REACTOR COOLANT PUMPS	427,056	160,440	107,520	0	695,016
PRESSURIZER	366,048	106,960	71,680	0	544,688
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	40,672	13,370	26,880	0	80,922
PRESSURIZER RELIEF TANK	122,016	26,740	17,920	0	166,676
SAFETY INJECTION ACCUM. TANKS	406,720	106,960	71,680	0	585,360
STEAM GENERATORS	2,172,088	427,840	286,720	0	2,886,648
REACTOR COOLANT PIPING	335,544	93,590	62,720	0	491,854
REMAINING CONTAM. MATLS	5,349,181	1,350,370	3,682,560	0	10,382,111
CONTAMINATED MATL OTHER BLDG	48,512,646	10,642,520	33,232,640	0	92,387,806
FILTER CARTRIDGES	32,029	80,220	53,760	0	166,009
SPENT RESINS	203,360	267,400	179,200	0	649,960
COMBUSTIBLE WASTES	1,029,510	802,200	537,600	0	2,369,310
EVAPORATOR BOTTOMS	955,792	1,256,780	842,240	0	3,054,812
POST-TMI-2 ADDITIONS	1,582,446	0	0	0	1,582,446
HEAVY OBJECT SURCHARGE					162,115
SITE AVAILABILITY CHARGES					387,039
SUBTOTAL PWR COSTS	65,812,990	18,223,310	42,443,520	754,728	127,783,702
TAXES & FEES (% OF CHARGES)					
TAXES & FEES (\$/UNIT VOL.)					
ANNUAL PERMIT FEES (3 YRS)					
TOTAL PWR COSTS					144,536,267

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-6 BWR Burial Costs at the Washington Site (2010 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
STEAM SEPARATOR	35,908	187,180	250,880	754,728	1,228,696
FUEL SUPPORT & PIECES	17,954	93,590	125,440	0	236,984
CONTROL RODS/INCORES	53,862	106,960	71,680	0	232,502
CONTROL RODS GUIDES	14,363	80,220	107,520	0	202,103
JET PUMPS	50,271	267,400	358,400	0	676,071
TOP FUEL GUIDES	86,179	962,640	645,120	0	1,693,939
CORE SUPPORT PLATE	39,499	213,920	277,760	0	531,179
CORE SHROUD ^(a)	168,767	1,871,800	1,254,400	0	3,294,967
REACTOR VESSEL WALL	28,726	267,400	197,120	0	493,246
SAC SHIELD NEUTRON ACTIV. MATL	323,171	187,180	125,440	0	635,791
REACTOR WATER REC	315,989	66,850	53,760	0	436,599
SAC SHIELD-CONTAMINATED MATL	1,113,144	508,060	340,480	0	1,961,684
OTHER PRIMARY CONTAINMENT	12,697,028	2,272,900	8,691,200	0	23,661,128
CONTAINMENT. ATMOSPHERIC	172,358	13,370	17,920	0	203,648
HIGH PRESSURE CORE SPRAY	61,043	26,740	17,920	0	105,703
LOW PRESSURE CORE SPRAY	35,908	13,370	8,960	0	58,238
REACTOR BLDG CLOSED COOLING	114,905	26,740	53,760	0	195,405
REACTOR CORE ISO COOLING	46,680	13,370	26,880	0	86,930
RESIDUAL HEAT REMOVAL	222,629	66,850	62,720	0	352,199
POOL LINER & RACKS	1,368,090	240,660	331,520	0	1,940,270
CONTAMINATED CONCRETE	1,558,402	374,360	967,680	0	2,900,442
OTHER REACTOR BUILDING	5,095,329	615,020	3,494,400	0	9,204,749
TURBINE	5,048,649	1,096,340	2,490,880	0	8,635,869
NUCLEAR STEAM CONDENSATE	1,303,456	173,810	394,240	0	1,871,506
LOW PRESSURE FEEDWATER HEATERS	2,646,411	561,540	394,240	0	3,602,191
MAIN STEAM	254,946	26,740	26,880	0	308,566
MOISTURE SEPARATOR REHEATERS	2,567,414	347,620	232,960	0	3,147,994
REACTOR FEEDWATER PUMPS	696,613	80,220	179,200	0	956,033
HIGH PRESSURE FEEDWATER HEATERS	434,485	106,960	71,680	0	613,125
OTHER TG BLDG	17,440,460	3,182,060	11,504,640	0	32,127,160
RAD WASTE BLDG	8,635,846	962,640	5,752,320	0	15,350,806
REACTOR BLDG	1,077,237	508,060	12,794,880	0	14,380,177
TG BLDG	728,930	334,250	8,637,440	0	9,700,620
RAD WASTE & CONTROL	628,388	307,510	7,454,720	0	8,390,618
CONCENTRATOR BOTTOMS	2,298,105	3,008,250	2,016,000	0	7,322,355
OTHER	624,797	815,570	546,560	0	1,986,927
POST-TMI-2 ADDITIONS	129,337	0	0	0	129,337
HEAVY OBJECT SURCHARGE					233,434
SITE AVAILABILITY CHARGES					387,039
SUBTOTAL BWR COSTS	68,135,281	19,988,150	69,977,600	754,728	159,476,232
TAXES & FEES (% OF CHARGES)					6,857,478
TAXES & FEES (\$/UNIT VOL.)					11,559,142
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL BWR COSTS					178,020,053

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-7 PWR Burial Costs at the Washington Site (2008 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
VESSEL WALL	375,060	560,120	269,040	2,869,000	4,073,220
VESSEL HEAD & BOTTOM	394,800	589,600	283,200	7,080	1,274,680
UPPER CORE SUPPORT ASSM	39,480	58,960	28,320	201,600	328,360
UPPER SUPPORT COLUMN	39,480	58,960	28,320	201,600	328,360
UPPER CORE BARREL	19,740	29,480	14,160	151,000	214,380
UPPER CORE GRID PLATE	49,350	73,700	35,400	377,500	535,950
GUIDE TUBES	59,220	88,440	42,480	302,400	492,540
LOWER CORE BARREL ^(a)	315,840	471,680	226,560	2,416,000	3,430,080
THERMAL SHIELDS ^(a)	59,220	88,440	42,480	453,000	643,140
CORE SHROUD ^(a)	39,480	58,960	28,320	302,000	428,760
LOWER GRID PLATE ^(a)	49,350	73,700	35,400	377,500	535,950
LOWER SUPPORT COLUMN	9,870	14,740	7,080	75,500	107,190
LOWER CORE FORGING	108,570	162,140	77,880	830,500	1,179,090
MISC. INTERNALS	78,960	117,920	56,640	604,000	857,520
BIO SHIELD CONCRETE	2,463,552	722,260	1,380,600	34,515	4,600,927
REACTOR CAVITY LINER	50,534	14,740	28,320	708	94,302
REACTOR COOLANT PUMPS	414,540	176,880	84,960	2,124	678,504
PRESSURIZER	355,320	117,920	56,640	1,416	531,296
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	39,480	14,740	21,240	531	75,991
PRESSURIZER RELIEF TANK	118,440	29,480	14,160	354	162,434
SAFETY INJECTION ACCUM. TANKS	394,800	117,920	56,640	1,416	570,776
STEAM GENERATORS	2,108,429	471,680	226,560	5,664	2,812,333
REACTOR COOLANT PIPING	325,710	103,180	49,560	1,239	479,689
REMAINING CONTAM. MATLS	5,192,410	1,488,740	2,909,880	72,747	9,663,777
CONTAMINATED MATL OTHER BLDG	47,089,967	11,733,040	26,259,720	656,493	85,739,220
FILTER CARTRIDGES	31,091	88,440	42,480	302,400	464,411
SPENT RESINS	197,400	294,800	141,600	1,510,000	2,143,800
COMBUSTIBLE WASTES	999,338	884,400	424,800	10,620	2,319,158
EVAPORATOR BOTTOMS	927,780	1,385,560	665,520	2,231,879	5,210,739
POST-TMI-2 ADDITIONS	1,536,068	0	0	0	1,536,068
HEAVY OBJECT SURCHARGE					152,809
SITE AVAILABILITY CHARGES (3 YRS)					374,400
SUBTOTAL PWR COSTS	63,883,279	20,090,620	33,537,960	14,000,786	132,039,854
TAXES & FEES (% OF CHARGES)					5,677,714
TAXES & FEES (\$/UNIT VOL.)					11,165,011
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL PWR COSTS					149,009,778

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-8 BWR Burial Costs at the Washington Site (2008 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
STEAM SEPARATOR	34,841	206,360	198,240	35,504,000	35,943,441
FUEL SUPPORT & PIECES	17,470	103,180	99,120	1,057,000	1,276,770
CONTROL RODS/INCORES	52,311	117,920	56,640	10,144,000	10,370,871
CONTROL RODS GUIDES	13,917	88,440	84,960	906,000	1,093,317
JET PUMPS	48,857	294,800	283,200	50,720,000	51,346,857
TOP FUEL GUIDES	83,698	1,061,280	509,760	91,296,000	92,950,738
CORE SUPPORT PLATE	38,394	235,840	219,480	2,340,500	2,834,214
CORE SHROUD ^(a)	163,842	2,063,600	991,200	177,520,000	180,738,642
REACTOR VESSEL WALL	27,932	294,800	155,760	1,661,000	2,139,492
SAC SHIELD (NEUTRON ACT. MATL.)	313,669	206,360	99,120	2,478	621,627
REACTOR WATER REC	306,760	73,700	42,480	1,062	424,002
SAC SHIELD (CONTAM. MATL.)	1,080,568	560,120	269,040	6,726	1,916,454
OTHER PRIMARY CONTAINMENT	12,324,669	2,505,800	6,563,160	164,079	21,557,708
CONTAINMENT ATMOSPHERIC	167,297	14,740	14,160	354	196,551
HIGH PRESSURE CORE SPRAY	59,220	29,480	14,160	354	103,214
LOW PRESSURE CORE SPRAY	34,841	14,740	7,080	177	56,838
REACTOR BLDG CLOSED COOLING	111,531	29,480	42,480	1,062	184,553
REACTOR CORE ISO COOLING	45,303	14,740	21,240	531	81,814
RESIDUAL HEAT REMOVAL	216,153	73,700	49,560	1,239	340,652
POOL LINER & RACKS	1,328,009	265,320	261,960	6,549	1,861,838
CONTAMINATED CONCRETE	1,512,775	412,720	764,640	19,116	2,709,251
OTHER REACTOR BUILDING	4,945,857	678,040	2,761,200	69,030	8,454,127
TURBINE	4,900,652	1,208,680	1,968,240	49,206	8,126,778
NUCLEAR STEAM CONDENSATE	1,265,235	191,620	311,520	7,788	1,776,163
LOW PRESSURE FEEDWATER HEATERS	2,568,766	619,080	311,520	7,788	3,507,154
MAIN STEAM	247,540	29,480	21,240	531	298,791
MOISTURE SEPARATOR REHEATERS	2,492,175	383,240	184,080	4,602	3,064,097
REACTOR FEEDWATER PUMPS	676,194	88,440	141,600	3,540	909,774
HIGH PRESSURE FEEDWATER HEATERS	421,745	117,920	56,640	1,416	597,721
OTHER TG BLDG	16,929,024	3,508,120	9,090,720	227,268	29,755,132
RAD WASTE BLDG	8,382,690	1,061,280	4,545,360	113,634	14,102,964
REACTOR BLDG	1,057,077	560,120	10,110,240	252,756	11,980,193
TG BLDG	713,601	368,500	6,825,120	170,628	8,077,849
RAD WASTE & CONTROL	615,888	339,020	5,890,560	147,264	6,992,732
CONCENTRATOR BOTTOMS	2,220,750	3,316,500	1,593,000	5,296,145	12,426,395
OTHER	602,070	899,140	431,880	246,454	2,179,544
POST-TMI-2 ADDITIONS	125,546	0	0	0	125,546
HEAVY OBJECT SURCHARGE					220,034
SITE AVAILABILITY CHARGES (3.5 YRS)					499,200
SUBTOTAL BWR COSTS	66,146,865	22,036,300	54,990,360	377,950,277	521,843,036
TAXES & FEES (% OF CHARGES)					22,439,251
TAXES & FEES (\$/UNIT VOL.)					11,560,622
ANNUAL PERMIT FEES (3.5 YRS)					169,600
TOTAL BWR COSTS					556,012,508

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-9 PWR Burial Costs at the Washington Site (2006 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
VESSEL WALL	330,220	460,180	230,280	1,014,600	2,035,280
VESSEL HEAD & BOTTOM	347,600	484,400	242,400	2,520	1,076,920
UPPER CORE SUPPORT ASSM	34,760	48,440	24,240	71,200	178,640
UPPER SUPPORT COLUMN	34,760	48,440	24,240	71,200	178,640
UPPER CORE BARREL	17,380	24,220	12,120	53,400	107,120
UPPER CORE GRID PLATE	43,450	60,550	30,300	133,500	267,800
GUIDE TUBES	52,140	72,660	36,360	106,800	267,960
LOWER CORE BARREL ^(a)	278,080	387,520	193,920	854,400	1,713,920
THERMAL SHIELDS ^(a)	52,140	72,660	36,360	160,200	321,360
CORE SHROUD ^(a)	34,760	48,440	24,240	106,800	214,240
LOWER GRID PLATE ^(a)	43,450	60,550	30,300	133,500	267,800
LOWER SUPPORT COLUMN	8,690	12,110	6,060	26,700	53,560
LOWER CORE FORGING	95,590	133,210	66,660	293,700	589,160
MISC. INTERNALS	69,520	96,880	48,480	213,600	428,480
BIO SHIELD CONCRETE	2,169,024	593,390	1,181,700	12,285	3,956,399
REACTOR CAVITY LINER	44,493	12,110	24,240	252	81,095
REACTOR COOLANT PUMPS	364,980	145,320	72,720	756	583,776
PRESSURIZER	312,840	96,880	48,480	504	458,704
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	34,760	12,110	18,180	189	65,239
PRESSURIZER RELIEF TANK	104,280	24,220	12,120	126	140,746
SAFETY INJECTION ACCUM. TANKS	347,600	96,880	48,480	504	493,464
STEAM GENERATORS	1,856,358	387,520	193,920	2,016	2,439,814
REACTOR COOLANT PIPING	286,770	84,770	42,420	441	414,401
REMAINING CONTAM. MATLS	4,571,635	1,223,110	2,490,660	25,893	8,311,298
CONTAMIN. MATRL OTHER BLDG	41,460,164	9,639,560	22,476,540	233,667	73,809,931
FILTER CARTRIDGES	27,374	72,660	36,360	106,800	243,194
SPENT RESINS	173,800	242,200	121,200	534,000	1,071,200
COMBUSTIBLE WASTES	879,863	726,600	363,600	3,780	1,973,843
EVAPORATOR BOTTOMS	816,860	1,138,340	569,640	790,701	3,315,541
POST-TMI-2 ADDITIONS	1,352,425	0	0	0	1,352,425
HEAVY OBJECT SURCHARGE					144,483
SITE AVAILABILITY CHARGES (3 YRS)					401,727
SUBTOTAL PWR COSTS	56,245,764	16,505,930	28,706,220	4,954,034	106,958,158
TAXES & FEES (% OF) CHARGES)					4,599,201
TAXES & FEES (\$/UNIT) VOL.)					11,165,011
ANNUAL PERMIT FEES (3 YRS)					127,200
TOTAL PWR COSTS					122,849,569

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-10 BWR Burial Costs at the Washington Site (2006 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	DISPOSAL COST
STEAM SEPARATOR	30,676	169,540	169,680	12,555,200	12,925,096
FUEL SUPPORT & PIECES	15,381	84,770	84,840	373,800	558,791
CONTROL RODS/INCORES	46,057	96,880	48,480	3,587,200	3,778,617
CONTROL RODS GUIDES	12,253	72,660	72,720	320,400	478,033
JET PUMPS	43,016	242,200	242,400	17,936,000	18,463,616
TOP FUEL GUIDES	73,691	871,920	436,320	32,284,800	33,666,731
CORE SUPPORT PLATE	33,804	193,760	187,860	827,700	1,243,124
CORE SHROUD ^(a)	144,254	1,695,400	848,400	62,776,000	65,464,054
REACTOR VESSEL WALL	24,593	242,200	133,320	587,400	987,513
SAC SHIELD (NEUTRON ACTIV. MATL)	276,168	169,540	84,840	882	531,430
REACTOR WATER REC	270,085	60,550	36,360	378	367,373
SAC SHIELD (CONTAM. MATL.)	951,381	460,180	230,280	2,394	1,644,235
OTHER PRIMARY CONTAINMENT	10,851,203	2,058,700	5,617,620	58,401	18,585,924
CONTAINMENT ATMOSPHERIC	147,296	12,110	12,120	126	171,652
HIGH PRESSURE CORE SPRAY	52,140	24,220	12,120	126	88,606
LOW PRESSURE CORE SPRAY	30,676	12,110	6,060	63	48,909
REACTOR BLDG CLOSED COOLING	98,197	24,220	36,360	378	159,155
REACTOR CORE ISO COOLING	39,887	12,110	18,180	189	70,366
RESIDUAL HEAT REMOVAL	190,311	60,550	42,420	441	293,722
POOL LINER & RACKS	1,169,240	217,980	224,220	2,331	1,613,771
CONTAMINATED CONCRETE	1,331,916	339,080	654,480	6,804	2,332,280
OTHER REACTOR BUILDING	4,354,559	557,060	2,363,400	24,570	7,299,589
TURBINE	4,314,759	993,020	1,684,680	17,514	7,009,973
NUCLEAR STEAM CONDENSATE	1,113,971	157,430	266,640	2,772	1,540,813
LOW PRESSURE FEEDWATER HEATERS	2,261,659	508,620	266,640	2,772	3,039,691
MAIN STEAM	217,945	24,220	18,180	189	260,534
MOISTURE SEPARATOR REHEATERS	2,194,225	314,860	157,560	1,638	2,668,283
REACTOR FEEDWATER PUMPS	595,352	72,660	121,200	1,260	790,472
HIGH PRESSURE FEEDWATER	371,324	96,880	48,480	504	517,188
OTHER TG BLDG	14,905,088	2,882,180	7,781,040	80,892	25,649,200
RAD WASTE BLDG	7,380,504	871,920	3,890,520	40,446	12,183,390
REACTOR BLDG	930,699	460,180	8,653,680	89,964	10,134,523
TG BLDG	628,287	302,750	5,841,840	60,732	6,833,609
RAD WASTE & CONTROL	542,256	278,530	5,041,920	52,416	5,915,122
CONCENTRATOR BOTTOMS	1,955,250	2,724,750	1,363,500	1,876,335	7,919,835
OTHER	530,090	738,710	369,660	87,766	1,726,226
POST-TMI-2 ADDITIONS	110,537	0	0	0	110,537
HEAVY OBJECT SURCHARGE					207,760
SITE AVAILABILITY CHARGES (3.5 YRS)					535,636
SUBTOTAL BWR COSTS	58,238,729	18,104,450	47,068,020	133,660,783	257,815,378
TAXES & FEES (% OF) CHARGES)					11,086,061
TAXES & FEES (\$/UNIT) VOL.)					11,560,622
ANNUAL PERMIT FEES (3.5) YRS)					169,600
TOTAL BWR COSTS					280,631,661

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-11 PWR Burial Costs at the Washington Site (2004 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	LINER DOSE RATE CHARGE	BENTON COUNTY TAX SURCHARGE	DISPOSAL COST
VESSEL WALL	215,080	373,160	187,340	1,520,000	0	2,295,580
VESSEL HEAD & BOTTOM	226,400	392,800	197,200	3,800	0	820,200
UPPER CORE SUPPORT ASSM	22,640	39,280	19,720	107,200	0	188,840
UPPER SUPPORT COLUMN	22,640	39,280	19,720	107,200	0	188,840
UPPER CORE BARREL	11,320	19,640	9,860	80,000	0	120,820
UPPER CORE GRID PLATE	28,300	49,100	24,650	200,000	0	302,050
GUIDE TUBES	33,960	58,920	29,580	160,800	0	283,260
LOWER CORE BARREL ^(a)	181,120	314,240	157,760	1,280,000	0	1,933,120
THERMAL SHIELDS ^(a)	33,960	58,920	29,580	240,000	0	362,460
CORE SHROUD ^(a)	22,640	39,280	19,720	160,000	0	241,640
LOWER GRID PLATE ^(a)	28,300	49,100	24,650	200,000	0	302,050
LOWER SUPPORT COLUMN	5,660	9,820	4,930	40,000	0	60,410
LOWER CORE FORGING	62,260	108,020	54,230	440,000	0	664,510
MISC. INTERNALS	45,280	78,560	39,440	320,000	0	483,280
BIO SHIELD CONCRETE	1,412,736	481,180	961,350	0	0	2,855,266
REACTOR CAVITY LINER	28,979	9,820	19,720	0	0	58,519
REACTOR COOLANT PUMPS	237,720	117,840	59,160	0	0	414,720
PRESSURIZER	203,760	78,560	39,440	0	0	321,760
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	22,640	9,820	14,790	0	0	47,250
PRESSURIZER RELIEF TANK	67,920	19,640	9,860	0	0	97,420
SAFETY INJECTION ACCUM. TANKS	226,400	78,560	39,440	0	0	344,400
STEAM GENERATORS	1,209,089	314,240	157,760	0	0	1,681,089
REACTOR COOLANT PIPING	186,780	68,740	34,510	0	0	290,030
REMAINING CONTAM. MATLS	2,977,613	991,820	2,026,230	0	0	5,995,663
CONTAM. MATL OTHER	27,003,973	7,816,720	18,285,370	0	0	53,106,063
FILTER CARTRIDGES	17,829	58,920	29,580	1,125,600	0	1,231,929
SPENT RESINS	113,200	196,400	98,600	800,000	0	1,208,200
COMBUSTIBLE WASTES	573,075	589,200	295,800	0	0	1,458,075
EVAPORATOR BOTTOMS	532,040	923,080	463,420	1,186,315	0	3,104,855
POST-TMI-2 ADDITIONS	880,866	0	0	0	0	880,866
HEAVY OBJECT SURCHARGE						136,313
SITE AVAILABILITY CHARGES (3 YRS)						382,821
SUBTOTAL PWR COSTS	36,634,180	13,384,660	23,353,410	7,970,915	0	81,862,299
TAXES & FEES (% OF CHARGES)						3,520,079
TAXES & FEES (\$/UNIT VOL.)						11,165,011
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						96,674,588

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-12 BWR Burial Costs at the Washington Site (2004 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	LINER DOSE RATE CHARGE	BENTON COUNTY TAX SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	19,980	137,480	138,040	18,816,000	0	19,111,500
FUEL SUPPORT & PIECES	10,018	68,740	69,020	560,000	0	707,778
CONTROL RODS/INCORES	29,998	78,560	39,440	5,376,000	0	5,523,998
CONTROL RODS GUIDES	7,981	58,920	59,160	480,000	0	606,061
JET PUMPS	28,017	196,400	197,200	26,880,000	0	27,301,617
TOP FUEL GUIDES	47,997	707,040	354,960	48,384,000	0	49,493,997
CORE SUPPORT PLATE	22,017	157,120	152,830	1,240,000	0	1,571,967
CORE SHROUD ^(a)	93,956	1,374,800	690,200	94,080,000	0	96,238,956
REACTOR VESSEL WALL	16,018	196,400	108,460	880,000	0	1,200,878
SAC SHIELD (NEUTRON ACTIV. MATL)	179,875	137,480	69,020	0	0	386,375
REACTOR WATER REC	175,913	49,100	29,580	0	0	254,593
SAC SHIELD (CONTAM. MATL)	619,657	373,160	187,340	0	0	1,180,157
OTHER PRIMARY CONTAINMENT	7,067,642	1,669,400	4,570,110	0	0	13,307,152
CONTAINMENT ATMOSPHERIC	95,937	9,820	9,860	0	0	115,617
HIGH PRESSURE CORE SPRAY	33,960	19,640	9,860	0	0	63,460
LOW PRESSURE CORE SPRAY	19,980	9,820	4,930	0	0	34,730
REACTOR BLDG CLOSED COOLING	63,958	19,640	29,580	0	0	113,178
REACTOR CORE ISO COOLING	25,979	9,820	14,790	0	0	50,589
RESIDUAL HEAT REMOVAL	123,954	49,100	34,510	0	0	207,564
POOL LINER & RACKS	761,553	176,760	182,410	0	0	1,120,723
CONTAMINATED CONCRETE	867,508	274,960	532,440	0	0	1,674,908
OTHER REACTOR BUILDING	2,836,226	451,720	1,922,700	0	0	5,210,646
TURBINE	2,810,303	805,240	1,370,540	0	0	4,986,083
NUCLEAR STEAM CONDENSATE	725,555	127,660	216,920	0	0	1,070,135
LOW PRESSURE FEEDWATER HEATERS	1,473,072	412,440	216,920	0	0	2,102,432
MAIN STEAM	141,953	19,640	14,790	0	0	176,383
MOISTURE SEPARATOR REHEATERS	1,429,150	255,320	128,180	0	0	1,812,650
REACTOR FEEDWATER PUMPS	387,767	58,920	98,600	0	0	545,287
HIGH PRESSURE FEEDWATER HEATERS	241,852	78,560	39,440	0	0	359,852
OTHER TG BLDG	9,708,032	2,337,160	6,330,120	0	0	18,375,312
RAD WASTE BLDG	4,807,095	707,040	3,165,060	0	0	8,679,195
REACTOR BLDG	606,186	373,160	7,040,040	0	0	8,019,386
TG BLDG	409,218	245,500	4,752,520	0	0	5,407,238
RAD WASTE & CONTROL	353,184	225,860	4,101,760	0	0	4,680,804
CONCENTRATOR BOTTOMS	1,273,500	2,209,500	1,109,250	2,815,175	0	7,407,425
OTHER	345,260	599,020	300,730	132,240	0	1,377,250
POST-TMI-2 ADDITIONS	71,995	0	0	0	0	71,995
HEAVY OBJECT SURCHARGE						196,250
SITE AVAILABILITY CHARGES (3.5 YRS)						510,428
SUBTOTAL BWR COSTS	37,932,245	14,680,900	38,291,310	199,643,415		0 291,254,548
TAXES & FEES (% OF) CHARGES)						12,523,946
TAXES & FEES (\$/UNIT) VOL.						11,560,622
ANNUAL PERMIT FEES (3.5 YRS)						169,600
TOTAL BWR COSTS						315,508,715

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-13 PWR Burial Costs at the South Carolina Site (2016 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	4,513,937	3,277,614	8,681,138	0	2,166,690	18,639,379
VESSEL HEAD & BOTTOM	2,876,052	3,450,120	11,380	0	0	6,337,552
UPPER CORE SUPPORT ASSM	271,519	345,012	5,690	0	86,886	709,107
UPPER SUPPORT COLUMN	251,027	345,012	56,900	0	80,329	733,268
UPPER CORE BARREL	119,547	172,506	456,902	0	57,383	806,338
UPPER CORE GRID PLATE	298,868	431,265	1,142,255	0	143,456	2,015,844
GUIDE TUBES	442,324	517,518	56,900	0	119,427	1,136,169
LOWER CORE BARREL ^(a)	1,912,752	2,760,096	7,310,432	0	918,121	12,901,401
THERMAL SHIELDS ^(a)	358,641	517,518	1,370,706	0	172,148	2,419,013
CORE SHROUD ^(a)	277,667	345,012	13,935,511	0	133,280	14,691,470
LOWER GRID PLATE ^(a)	298,868	431,265	2,284,510	0	143,456	3,158,099
LOWER SUPPORT COLUMN	75,820	86,253	228,451	0	36,394	426,918
LOWER CORE FORGING	823,778	948,783	1,422,500	0	395,414	3,590,475
MISC INTERNALS	667,840	690,024	1,138,000	0	320,563	2,816,427
BIO SHIELD CONCRETE	16,278,600	0	1,138,000	0	0	17,416,600
REACTOR CAVITY LINER	327,872	0	5,690	0	0	333,562
REACTOR COOLANT PUMPS	5,706,928	0	44,189	0	0	5,751,117
PRESSURIZER	2,590,185	0	2,885	0	0	2,593,070
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	239,094	0	6,709	0	0	245,803
PRESSURIZER RELIEF TANK	717,282	0	2,299	0	0	719,581
SAFETY INJECTION ACCUM TANKS	2,554,488	0	46,339	0	0	2,600,827
STEAM GENERATORS	20,884,928	0	2,503,600	0	0	23,388,528
REACTOR COOLANT PIPING	2,274,612	0	169,562	0	0	2,444,174
REMAINING CONTAM. MATLS	40,210,427	0	127,337	0	0	40,337,764
CONTAMINATED MATRL OTHR BLD	309,340,162	0	104,838	0	0	309,445,001
FILTER CARTRIDGES	409,806	517,518	1,370,706	0	49,177	2,347,207
SPENT RESINS	1,502,640	1,725,060	4,569,020	0	721,267	8,517,987
COMBUSTIBLE WASTES – CLASS A	4,169,202	0	132,293	0	0	4,301,494
COMBUSTIBLE WASTES – CLASS B	2,253,960	5,175,180	298,725	0	180,317	7,908,182
EVAPORATOR BOTTOMS	7,062,408	8,107,782	7,855,045	0	964,695	23,989,930
POST-TMI-2 ADDITIONS	14,166,612	0	0	0	0	14,166,612
SUBTOTAL PWR COSTS	443,877,846	29,843,538	56,478,510	0	6,689,002	536,888,896
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						3,883,494
TOTAL PWR COSTS (INSIDE COMPACT)						540,772,391

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-14 BWR Burial Costs at the South Carolina Site (2016 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	278,198	2,415,084	3,198,314	0	133,535	6,025,131
FUEL SUPPORT & PIECES	122,430	1,207,542	398,300	0	58,766	1,787,038
CONTROL RODS/INCORES	364,587	690,024	1,827,608	0	175,002	3,057,221
CONTROL RODS GUIDES	102,494	1,035,036	56,900	0	37,923	1,232,353
JET PUMPS	295,523	3,450,120	4,569,020	0	141,851	8,456,514
TOP FUEL GUIDES	506,611	6,210,216	16,448,472	0	243,173	23,408,472
CORE SUPPORT PLATE	340,478	2,673,843	369,850	0	125,977	3,510,147
CORE SHROUD ^(a)	992,112	12,075,420	31,983,140	0	476,214	45,526,886
REACTOR VESSEL WALL	215,944	1,897,566	1,229,040	0	79,899	3,422,449
SAC SHIELD Neutron-Activated Matl	4,550,800	0	96,730	0	0	4,647,530
REACT. WATER REC	1,969,271	0	25,008	0	0	1,994,279
SAC SHIELD Contaminated Matl	11,785,233	0	88,098	0	0	11,873,330
OTHER PRIMARY CONTAINMENT	82,668,738	0	1,004,882	0	0	83,673,620
CONTAINM. ATMOSPHERIC	1,013,221	0	13,641	0	0	1,026,862
HIGH PRESSURE CORE SPRAY	512,373	0	4,831	0	0	517,204
LOW PRESSURE CORE SPRAY	227,241	0	2,842	0	0	230,083
REACTOR BLDG CLOSED COOLING	796,525	0	9,094	0	0	805,619
REACTOR CORE ISO COOLING	274,414	0	3,694	0	0	278,108
RESIDUAL HEAT REMOVAL	1,513,745	0	17,620	0	0	1,531,364
POOL LINER & RACKS	10,152,764	0	108,275	0	0	10,261,038
CONTAMINATED CONCRETE	11,197,151	0	123,337	0	0	11,320,488
OTHER REACTOR BUILDING	29,953,348	0	403,260	0	0	30,356,608
TURBINE	37,559,811	0	399,566	0	0	37,959,377
NUCLEAR STEAM CONDENSATE	7,662,484	0	103,160	0	0	7,765,644
LOW PRESSURE FEEDWATER HEATERS	16,670,360	0	209,445	0	0	16,879,805
MAIN STEAM	1,498,723	0	20,177	0	0	1,518,900
MOISTURE SEPARATOR REHEATERS	15,092,772	0	203,193	0	0	15,295,965
REACTOR FEEDWATER PUMPS	4,095,102	0	55,132	0	0	4,150,234
HIGH PRESSURE FEEDWATER HEATERS	2,704,680	0	34,387	0	0	2,739,066
OTHER TG BLDG	102,525,308	0	1,380,292	0	0	103,905,599
RAD WASTE BLDG	50,766,598	0	683,468	0	0	51,450,065
REACTOR BLDG – CLASS A	4,366,350	0	140,116	0	0	4,506,466
REACTOR BLDG – CLASS B	10,927,273	5,520,192	315,084	0	874,182	17,636,731
TG BLDG – CLASS A	2,947,840	0	94,596	0	0	3,042,436
TG BLDG – CLASS B	7,171,023	3,622,626	212,664	0	573,682	11,579,995
RAD WASTE & CONTROL – CLASS A	2,544,451	0	81,652	0	0	2,626,103
RAD WASTE & CONTROL – CLASS B	6,488,068	3,277,614	183,503	0	519,045	10,468,230
CONCENTRATOR BOTTOMS – CLASS A	22,316,151	14,921,769	826,188	0	3,931,770	41,995,879
CONCENTRATOR BOTTOMS – CLASS B	6,707,745	4,485,156	11,879,452	0	1,181,804	24,254,157
OTHER	7,868,701	5,261,433	187,201	0	196,073	13,513,407
POST-TMI-2 ADDITIONS	1,157,771	0	0	0	0	1,157,771
SUBTOTAL BWR COSTS	470,904,409	68,743,641	78,991,229	0	8,748,896	627,388,174
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						4,020,364
TOTAL BWR COSTS (INSIDE COMPACT)						631,408,538

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-15 PWR Burial Costs at the South Carolina Site (2012 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	4,470,517	3,246,036	8,553,154	0	2,145,848	18,415,555
VESSEL HEAD & BOTTOM	2,848,544	3,416,880	11,260	0	0	6,276,684
UPPER CORE SUPPORT ASSM	268,922	341,688	5,630	0	86,055	702,295
UPPER SUPPORT COLUMN	248,626	341,688	56,300	0	79,560	726,174
LOWER CORE BARREL ^(a)	118,395	170,844	450,166	0	56,830	796,235
THERMAL SHIELDS ^(a)	295,988	427,110	1,125,415	0	142,074	1,990,587
CORE SHROUD ^(a)	438,062	512,532	56,300	0	118,277	1,125,170
LOWER GRID PLATE ^(a)	1,894,320	2,733,504	7,202,656	0	909,274	12,739,754
THERMAL SHIELDS	355,185	512,532	1,350,498	0	170,489	2,388,704
CORE SHROUD	275,011	341,688	13,730,063	0	132,005	14,478,767
LOWER GRID PLATE	295,988	427,110	2,250,830	0	142,074	3,116,002
LOWER SUPPORT COLUMN	75,095	85,422	225,083	0	36,046	421,646
LOWER CORE FORGING	815,899	939,642	1,407,500	0	391,632	3,554,673
MISC INTERNALS	661,440	683,376	1,126,000	0	317,491	2,788,307
BIO SHIELD CONCRETE	16,122,600	0	675,600	0	0	16,798,200
REACTOR CAVITY LINER	324,736	0	5,630	0	0	330,366
REACTOR COOLANT PUMPS	5,652,032	0	43,723	0	0	5,695,755
PRESSURIZER	2,565,225	0	2,854	0	0	2,568,079
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	236,790	0	6,638	0	0	243,428
PRESSURIZER RELIEF TANK	710,370	0	2,275	0	0	712,645
SAFETY INJECTION ACCUM TANKS	2,530,008	0	45,851	0	0	2,575,859
STEAM GENERATORS	20,684,032	0	2,477,200	0	0	23,161,232
REACTOR COOLANT PIPING	2,252,856	0	167,774	0	0	2,420,630
REMAINING CONTAM. MATLS	39,825,826	0	125,994	0	0	39,951,820
CONTAMINATED MATRL OTHR BLD	306,381,414	0	103,733	0	0	306,485,147
FILTER CARTRIDGES	405,864	512,532	2,815,000	0	48,704	3,782,100
SPENT RESINS	1,488,240	1,708,440	4,501,660	0	714,355	8,412,695
COMBUSTIBLE WASTES	7,103,700	5,125,320	168,900	0	0	12,397,920
EVAPORATOR BOTTOMS	6,994,728	8,029,668	21,157,802	0	955,450	37,137,648
POST-TMI-2 ADDITIONS	14,036,581	0	0	0	0	14,036,581
SUBTOTAL PWR COSTS	440,376,992	29,556,012	69,851,488	0	6,446,163	546,230,654
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						3,883,536
TOTAL PWR COSTS (INSIDE COMPACT)						550,114,190

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-16 BWR Burial Costs at the South Carolina Site (2012 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	275,517	2,391,816	3,151,162	0	132,248	5,950,743
FUEL SUPPORT & PIECES	121,259	1,195,908	394,100	0	58,204	1,769,471
CONTROL RODS/INCORES	361,093	683,376	1,800,664	0	173,325	3,018,458
CONTROL RODS GUIDES	101,506	1,025,064	56,300	0	37,557	1,220,428
JET PUMPS	292,675	3,416,880	4,501,660	0	140,484	8,351,699
TOP FUEL GUIDES	501,729	6,150,384	16,205,976	0	240,830	23,098,918
CORE SUPPORT PLATE	337,215	2,648,082	365,950	0	124,769	3,476,016
CORE SHROUD ^(a)	982,552	11,959,080	31,511,620	0	471,625	44,924,877
REACTOR VESSEL WALL	213,878	1,879,284	1,216,080	0	79,135	3,388,377
SAC SHIELD Neutron-Activated Matl	4,507,025	0	95,710	0	0	4,602,735
REACT. WATER REC	1,950,435	0	24,745	0	0	1,975,180
SAC SHIELD Contaminated Matl	11,671,868	0	87,169	0	0	11,759,037
OTHER PRIMARY CONTAINMENT	81,872,111	0	994,286	0	0	82,866,397
CONTAINM. ATMOSPHERIC	1,003,457	0	13,497	0	0	1,016,954
HIGH PRESSURE CORE SPRAY	507,463	0	4,780	0	0	512,243
LOW PRESSURE CORE SPRAY	225,067	0	2,812	0	0	227,879
REACTOR BLDG CLOSED COOLING	788,849	0	8,998	0	0	797,847
REACTOR CORE ISO COOLING	271,770	0	3,655	0	0	275,425
RESIDUAL HEAT REMOVAL	1,499,238	0	17,434	0	0	1,516,672
POOL LINER & RACKS	10,054,928	0	107,133	0	0	10,162,061
CONTAMINATED CONCRETE	11,090,053	0	122,036	0	0	11,212,090
OTHER REACTOR BUILDING	29,664,706	0	399,008	0	0	30,063,714
TURBINE	37,200,563	0	395,352	0	0	37,595,915
NUCLEAR STEAM CONDENSATE	7,588,646	0	102,072	0	0	7,690,718
LOW PRESSURE FEEDWATER HEATERS	16,510,913	0	207,237	0	0	16,718,149
MAIN STEAM	1,484,281	0	19,964	0	0	1,504,245
MOISTURE SEPARATOR REHEATERS	14,947,333	0	201,050	0	0	15,148,383
REACTOR FEEDWATER PUMPS	4,055,640	0	54,551	0	0	4,110,191
HIGH PRESSURE FEEDWATER HEATERS	2,678,760	0	34,024	0	0	2,712,784
OTHER TG BLDG	101,537,335	0	1,365,737	0	0	102,903,072
RAD WASTE BLDG	50,277,392	0	676,260	0	0	50,953,652
REACTOR BLDG	12,851,317	5,467,008	106,970	0	0	18,425,295
TG BLDG	8,454,814	3,587,724	70,375	0	0	12,112,913
RAD WASTE & CONTROL	7,778,429	3,246,036	64,745	0	0	11,089,210
CONCENTRATOR BOTTOMS	28,744,710	19,219,950	50,643,675	0	3,893,950	102,502,285
OTHER	7,793,010	5,210,742	539,917	0	194,186	13,737,856
POST-TMI-2 ADDITIONS	1,147,242	0	0	0	0	1,147,242
SUBTOTAL BWR COSTS	461,344,779	68,081,334	115,566,704	0	5,546,314	650,539,131
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						4,020,571
TOTAL BWR COSTS (INSIDE COMPACT)						654,559,702

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-17 PWR Burial Costs at the South Carolina Site (2010 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	3,986,350	2,894,422	7,626,676	0	1,913,448	16,420,895
VESSEL HEAD & BOTTOM	2,540,054	3,046,760	10,040	0	0	5,596,854
UPPER CORE SUPPORT ASSM	239,799	304,676	5,020	0	76,736	626,230
UPPER SUPPORT COLUMN	221,701	304,676	50,200	0	70,944	647,521
UPPER CORE BARREL	105,570	152,338	401,404	0	50,674	709,986
UPPER CORE GRID PLATE	263,925	380,845	1,003,510	0	126,684	1,774,964
GUIDE TUBES	390,609	457,014	50,200	0	105,464	1,003,287
LOWER CORE BARREL ^(a)	1,689,120	2,437,408	6,422,464	0	810,778	11,359,770
THERMAL SHIELDS ^(a)	316,710	457,014	1,204,212	0	152,021	2,129,957
CORE SHROUD ^(a)	245,228	304,676	12,242,822	0	117,709	12,910,435
LOWER GRID PLATE ^(a)	263,925	380,845	2,007,020	0	126,684	2,778,474
LOWER SUPPORT COLUMN	66,963	76,169	200,702	0	32,142	375,976
LOWER CORE FORGING	727,540	837,859	1,255,000	0	349,219	3,169,618
MISC. INTERNALS	589,840	609,352	1,004,000	0	283,123	2,486,315
BIO SHIELD CONCRETE	14,377,350	0	602,400	0	0	14,979,750
REACTOR CAVITY LINER	289,568	0	5,020	0	0	294,588
REACTOR COOLANT PUMPS	5,039,904	0	38,985	0	0	5,078,889
PRESSURIZER	2,287,350	0	2,545	0	0	2,289,895
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	211,140	0	5,919	0	0	217,059
PRESSURIZER RELIEF TANK	633,420	0	2,028	0	0	635,448
SAFETY INJECTION ACCUM. TANKS	2,256,138	0	40,883	0	0	2,297,021
STEAM GENERATORS	18,443,904	0	2,208,800	0	0	20,652,704
REACTOR COOLANT PIPING	2,008,878	0	149,596	0	0	2,158,474
REMAINING CONTAM. MATLS	35,512,801	0	112,343	0	0	35,625,143
CONTAM. MATL OTHER BLDG	273,201,164	0	92,494	0	0	273,293,658
FILTER CARTRIDGES	361,908	457,014	2,510,000	0	43,429	3,372,351
SPENT RESINS	1,327,140	1,523,380	4,014,040	0	637,027	7,501,587
COMBUSTIBLE WASTES	6,334,200	4,570,140	150,600	0	0	11,054,940
EVAPORATOR BOTTOMS	6,237,558	7,159,886	18,865,988	0	852,024	33,115,456
POST-TMI-2 ADDITIONS	12,516,387	0	0	0	0	12,516,387
SUBTOTAL PWR COSTS	392,686,142	26,354,474	62,284,910	0	5,748,106	487,073,631
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						3,883,536
TOTAL PWR COSTS (INSIDE COMPACT)						490,957,167

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-18 BWR Burial Costs at the South Carolina Site (2010 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	245,672	2,132,732	2,809,828	0	117,923	5,306,155
FUEL SUPPORT & PIECES	108,127	1,066,366	351,400	0	51,901	1,577,794
CONTROL RODS/INCORES	322,005	609,352	1,605,616	0	154,563	2,691,536
CONTROL RODS GUIDES	90,511	914,028	50,200	0	33,489	1,088,228
JET PUMPS	260,971	3,046,760	4,014,040	0	125,266	7,447,038
TOP FUEL GUIDES	447,379	5,484,168	14,450,544	0	214,742	20,596,834
CORE SUPPORT PLATE	300,712	2,361,239	326,300	0	111,263	3,099,514
CORE SHROUD ^(a)	876,118	10,663,660	28,098,280	0	420,537	40,058,595
REACTOR VESSEL WALL	190,716	1,675,718	1,084,320	0	70,565	3,021,319
SAC SHIELD NEUTRON ACTIV. MATL	4,018,904	0	85,340	0	0	4,104,244
REACTOR WATER REC	1,739,209	0	22,064	0	0	1,761,273
SAC SHIELD-CONTAMINATED MATL	10,407,780	0	77,724	0	0	10,485,504
OTHER PRIMARY CONTAINMENT	73,003,420	0	886,557	0	0	73,889,977
CONTAINMENT ATMOSPHERIC	894,759	0	12,035	0	0	906,794
HIGH PRESSURE CORE SPRAY	452,530	0	4,262	0	0	456,793
LOW PRESSURE CORE SPRAY	200,693	0	2,507	0	0	203,201
REACTOR BLDG CLOSED COOLING	703,398	0	8,023	0	0	711,421
REACTOR CORE ISO COOLING	242,331	0	3,259	0	0	245,590
RESIDUAL HEAT REMOVAL	1,336,948	0	15,545	0	0	1,352,493
POOL LINER & RACKS	8,965,741	0	95,525	0	0	9,061,266
CONTAMINATED CONCRETE	9,889,033	0	108,814	0	0	9,997,847
OTHER REACTOR BUILDING	26,451,312	0	355,776	0	0	26,807,088
TURBINE	33,171,850	0	352,517	0	0	33,524,367
NUCLEAR STEAM CONDENSATE	6,766,615	0	91,012	0	0	6,857,627
LOW PRESSURE FEEDWATER HEATERS	14,722,829	0	184,783	0	0	14,907,612
MAIN STEAM	1,323,498	0	17,801	0	0	1,341,299
MOISTURE SEPARATOR REHEATERS	13,328,180	0	179,267	0	0	13,507,447
REACTOR FEEDWATER PUMPS	3,616,317	0	48,640	0	0	3,664,958
HIGH PRESSURE FEEDWATER HEATERS	2,388,788	0	30,337	0	0	2,419,126
OTHER TG BLDG	90,538,422	0	1,217,762	0	0	91,756,184
RAD WASTE BLDG	44,831,152	0	602,989	0	0	45,434,141
REACTOR BLDG	11,459,491	4,874,816	95,380	0	0	16,429,687
TG BLDG	7,539,139	3,199,098	62,750	0	0	10,800,987
RAD WASTE & CONTROL	6,936,008	2,894,422	57,730	0	0	9,888,160
CONCENTRATOR BOTTOMS	25,631,595	17,138,025	45,157,950	0	3,472,227	91,399,797
OTHER	6,949,010	4,646,309	481,418	0	173,156	12,249,893
POST-TMI-2 ADDITIONS	1,022,993	0	0	0	0	1,022,993
SUBTOTAL BWR COSTS	411,374,158	60,706,693	103,048,296	0	4,945,631	580,074,778
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						4,020,571
TOTAL BWR COSTS (INSIDE COMPACT)						584,095,349

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-19 PWR Burial Costs at the South Carolina Site (2008 dollars)

REFERENCE PWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	3,682,407	2,673,832	7,052,800	0	1,767,555	15,176,594
VESSEL HEAD & BOTTOM	2,346,371	2,814,560	9,280	0	0	5,170,211
UPPER CORE SUPPORT ASSM	221,514	281,456	4,640	0	70,884	578,494
UPPER SUPPORT COLUMN	204,796	281,456	46,400	0	65,535	598,186
UPPER CORE BARREL	97,524	140,728	371,200	0	46,812	656,264
UPPER CORE GRID PLATE	243,810	351,820	928,000	0	117,029	1,640,659
GUIDE TUBES	360,839	422,184	46,400	0	97,426	926,849
LOWER CORE BARREL ^(a)	1,560,384	2,251,648	5,939,200	0	748,984	10,500,216
THERMAL SHIELDS ^(a)	292,572	422,184	1,113,600	0	140,435	1,968,791
CORE SHROUD ^(a)	226,529	281,456	11,321,600	0	108,734	11,938,319
LOWER GRID PLATE ^(a)	243,810	351,820	1,856,000	0	117,029	2,568,659
LOWER SUPPORT COLUMN	61,857	70,364	185,600	0	29,691	347,512
LOWER CORE FORGING	672,064	774,004	1,160,000	0	322,591	2,928,658
MISC. INTERNALS	544,880	562,912	928,000	0	261,542	2,297,334
BIO SHIELD CONCRETE	13,281,450	0	556,800	0	0	13,838,250
REACTOR CAVITY LINER	267,488	0	4,640	0	0	272,128
REACTOR COOLANT PUMPS	4,655,632	0	36,034	0	0	4,691,666
PRESSURIZER	2,113,020	0	2,352	0	0	2,115,372
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	195,048	0	5,471	0	0	200,519
PRESSURIZER RELIEF TANK	585,144	0	1,875	0	0	587,019
SAFETY INJECTION ACCUM. TANKS	2,084,166	0	37,788	0	0	2,121,954
STEAM GENERATORS	17,037,632	0	2,041,600	0	0	19,079,232
REACTOR COOLANT PIPING	1,855,681	0	138,272	0	0	1,993,953
REMAINING CONTAM. MATLS	32,804,896	0	103,839	0	0	32,908,734
CONTAM. MATL OTHER BLDG	252,369,160	0	85,492	0	0	252,454,652
FILTER CARTRIDGES	334,314	422,184	2,320,000	0	40,118	3,116,616
SPENT RESINS	1,225,980	1,407,280	3,712,000	0	588,470	6,933,730
COMBUSTIBLE WASTES	5,851,440	4,221,840	139,200	0	0	10,212,480
EVAPORATOR BOTTOMS	5,762,106	6,614,216	17,446,400	0	787,079	30,609,801
POST-TMI-2 ADDITIONS	11,562,064	0	0	0	0	11,562,064
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						3,883,482
TOTAL PWR COSTS (INSIDE COMPACT)						453,878,398

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-20 BWR Burial Costs at the South Carolina Site (2008 dollars)

REFERENCE BWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	226,342	1,970,192	2,598,400	0	108,644	4,903,579
FUEL SUPPORT & PIECES	99,706	985,096	324,800	0	47,859	1,457,461
CONTROL RODS/INCORES	296,851	562,912	1,484,800	0	142,488	2,487,051
CONTROL RODS GUIDES	83,437	844,368	46,400	0	30,872	1,005,077
JET PUMPS	241,372	2,814,560	3,712,000	0	115,859	6,883,790
TOP FUEL GUIDES	413,502	5,066,208	13,363,200	0	198,481	19,041,391
CORE SUPPORT PLATE	277,208	2,181,284	301,600	0	102,567	2,862,659
CORE SHROUD ^(a)	809,449	9,850,960	25,984,000	0	388,536	37,032,945
REACTOR VESSEL WALL	176,108	1,548,008	1,002,240	0	65,160	2,791,516
SAC SHIELD	3,704,707	0	77,952	0	0	3,782,659
REACTOR WATER REC	1,603,223	0	20,391	0	0	1,623,614
SAC SHIELD	9,594,069	0	71,829	0	0	9,665,898
OTHER PRIMARY CONTAINMENT	67,298,062	0	819,267	0	0	68,117,329
CONTAINMENT ATMOSPHERIC	826,516	0	11,121	0	0	837,637
HIGH PRESSURE CORE SPRAY	415,471	0	3,937	0	0	419,408
LOW PRESSURE CORE SPRAY	183,898	0	2,316	0	0	186,214
REACTOR BLDG CLOSED COOLING	648,426	0	7,414	0	0	655,840
REACTOR CORE ISO COOLING	223,818	0	3,011	0	0	226,829
RESIDUAL HEAT REMOVAL	1,253,238	0	14,369	0	0	1,267,606
POOL LINER & RACKS	8,265,051	0	88,278	0	0	8,353,328
CONTAMINATED CONCRETE	9,115,824	0	100,560	0	0	9,216,384
OTHER REACTOR BUILDING	24,434,638	0	328,770	0	0	24,763,408
TURBINE	30,578,192	0	325,765	0	0	30,903,956
NUCLEAR STEAM CONDENSATE	6,250,801	0	84,105	0	0	6,334,906
LOW PRESSURE FEEDWATER HEATERS	13,571,672	0	170,756	0	0	13,742,428
MAIN STEAM	1,222,951	0	16,455	0	0	1,239,406
MOISTURE SEPARATOR REHEATERS	12,312,405	0	165,664	0	0	12,478,069
REACTOR FEEDWATER PUMPS	3,340,685	0	44,949	0	0	3,385,634
HIGH PRESSURE FEEDWATER HEATERS	2,202,078	0	28,035	0	0	2,230,113
OTHER TG BLDG	83,636,582	0	1,125,336	0	0	84,761,918
RAD WASTE BLDG	41,414,054	0	557,229	0	0	41,971,283
REACTOR BLDG	10,585,738	4,503,296	88,160	0	0	15,177,194
TG BLDG	6,964,301	2,955,288	58,000	0	0	9,977,589
RAD WASTE & CONTROL	6,407,157	2,673,832	53,360	0	0	9,134,349
CONCENTRATOR BOTTOMS	23,677,260	15,831,900	41,760,000	0	3,207,479	84,476,639
OTHER	6,419,168	4,292,204	444,976	0	159,953	11,316,301
POST-TMI-2 ADDITIONS	944,994	0	0	0	0	944,994
SUBTOTAL BWR COSTS	379,718,953	56,080,108	95,289,444	0	4,567,898	535,656,402
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						4,021,086
TOTAL BWR COSTS (INSIDE COMPACT)						539,677,488

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-21 PWR Burial Costs at the South Carolina Site (2006 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	3,344,560	2,428,580	6,399,200	0	1,605,389	13,777,729
VESSEL HEAD & BOTTOM	2,131,074	2,556,400	8,420	0	0	4,695,894
UPPER CORE SUPPORT ASSM	201,188	255,640	4,210	0	64,380	525,418
UPPER SUPPORT COLUMN	186,004	255,640	42,100	0	59,521	543,265
UPPER CORE BARREL	88,578	127,820	336,800	0	42,517	595,715
UPPER CORE GRID PLATE	221,445	319,550	842,000	0	106,294	1,489,289
GUIDE TUBES	327,739	383,460	42,100	0	88,489	841,788
LOWER CORE BARREL ^(a)	1,417,248	2,045,120	5,388,800	0	680,279	9,531,447
THERMAL SHIELDS ^(a)	265,734	383,460	1,010,400	0	127,552	1,787,146
CORE SHROUD ^(a)	205,743	255,640	10,272,400	0	98,757	10,832,540
LOWER GRID PLATE ^(a)	221,445	319,550	1,684,000	0	106,294	2,331,289
LOWER SUPPORT COLUMN	56,181	63,910	168,400	0	26,967	315,458
LOWER CORE FORGING	610,397	703,010	1,052,500	0	292,990	2,658,897
MISC. INTERNALS	494,880	511,280	842,000	0	237,542	2,085,702
BIO SHIELD CONCRETE	12,062,700	0	505,200	0	0	12,567,900
REACTOR CAVITY LINER	242,944	0	4,210	0	0	247,154
REACTOR COOLANT PUMPS	4,228,496	0	32,695	0	0	4,261,191
PRESSURIZER	1,919,190	0	2,134	0	0	1,921,324
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	177,156	0	4,964	0	0	182,120
PRESSURIZER RELIEF TANK	531,468	0	1,701	0	0	533,169
SAFETY INJECTION ACCUM. TANKS	1,892,916	0	34,286	0	0	1,927,202
STEAM GENERATORS	15,474,496	0	1,852,400	0	0	17,326,896
REACTOR COOLANT PIPING	1,685,409	0	125,458	0	0	1,810,867
REMAINING CONTAM. MATLS	29,794,804	0	94,216	0	0	29,889,020
CONTAM. MATL OTHER BLDG	229,212,426	0	77,569	0	0	229,289,995
FILTER CARTRIDGES	303,642	383,460	2,105,000	0	36,437	2,828,539
SPENT RESINS	1,113,480	1,278,200	3,368,000	0	534,470	6,294,150
COMBUSTIBLE WASTES	5,314,680	3,834,600	126,300	0	0	9,275,580
EVAPORATOR BOTTOMS	5,233,356	6,007,540	15,829,600	0	714,854	27,785,350
POST-TMI-2 ADDITIONS	10,501,290	0	0	0	0	10,501,290
SUBTOTAL PWR COSTS	329,460,668	22,112,860	52,257,063	0	4,822,734	408,653,325
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						3,883,482
TOTAL PWR COSTS (INSIDE COMPACT)						412,536,807

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-22 BWR Burial Costs at the South Carolina Site (2006 dollars)

REFERENCE BWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	205,580	1,789,480	2,357,600	0	98,678	4,451,338
FUEL SUPPORT & PIECES	90,557	894,740	294,700	0	43,468	1,323,465
CONTROL RODS/INCORES	269,611	511,280	1,347,200	0	129,413	2,257,504
CONTROL RODS GUIDES	75,783	766,920	42,100	0	28,040	912,843
JET PUMPS	219,231	2,556,400	3,368,000	0	105,231	6,248,861
TOP FUEL GUIDES	375,571	4,601,520	12,124,800	0	180,274	17,282,165
CORE SUPPORT PLATE	251,770	1,981,210	273,650	0	93,155	2,599,785
CORE SHROUD ^(a)	735,197	8,947,400	23,576,000	0	352,895	33,611,492
REACTOR VESSEL WALL	159,949	1,406,020	909,360	0	59,181	2,534,509
SAC SHIELD	3,364,814	0	70,728	0	0	3,435,542
REACTOR WATER REC	1,456,115	0	18,502	0	0	1,474,617
SAC SHIELD	8,713,851	0	65,173	0	0	8,779,023
OTHER PRIMARY CONTAINMENT	61,124,725	0	743,344	0	0	61,868,069
CONTAINMENT ATMOSPHERIC	750,699	0	10,090	0	0	760,789
HIGH PRESSURE CORE SPRAY	377,346	0	3,572	0	0	380,918
LOW PRESSURE CORE SPRAY	167,024	0	2,101	0	0	169,125
REACTOR BLDG CLOSED COOLING	588,945	0	6,727	0	0	595,672
REACTOR CORE ISO COOLING	203,287	0	2,732	0	0	206,019
RESIDUAL HEAT REMOVAL	1,138,236	0	13,037	0	0	1,151,273
POOL LINER & RACKS	7,506,887	0	80,097	0	0	7,586,984
CONTAMINATED CONCRETE	8,279,380	0	91,241	0	0	8,370,620
OTHER REACTOR BUILDING	22,193,218	0	298,302	0	0	22,491,520
TURBINE	27,772,417	0	295,575	0	0	28,067,992
NUCLEAR STEAM CONDENSATE	5,677,407	0	76,311	0	0	5,753,718
LOW PRESSURE FEEDWATER HEATERS	12,326,371	0	154,931	0	0	12,481,302
MAIN STEAM	1,110,768	0	14,930	0	0	1,125,698
MOISTURE SEPARATOR REHEATERS	11,182,973	0	150,312	0	0	11,333,284
REACTOR FEEDWATER PUMPS	3,034,239	0	40,784	0	0	3,075,023
HIGH PRESSURE FEEDWATER HEATERS	2,000,008	0	25,437	0	0	2,025,445
OTHER TG BLDG	75,964,493	0	1,021,048	0	0	76,985,541
RAD WASTE BLDG	37,615,091	0	505,589	0	0	38,120,680
REACTOR BLDG	9,614,538	4,090,240	79,990	0	0	13,784,768
TG BLDG	6,325,354	2,684,220	52,625	0	0	9,062,199
RAD WASTE & CONTROL	5,819,326	2,428,580	48,415	0	0	8,296,321
CONCENTRATOR BOTTOMS	21,504,964	14,379,750	37,890,000	0	2,913,206	76,687,920
OTHER	5,830,235	3,898,510	403,739	0	145,278	10,277,762
POST-TMI-2 ADDITIONS	858,295	0	0	0	0	858,295
SUBTOTAL BWR COSTS	344,884,253	50,936,270	86,458,741	0	4,148,818	486,428,082
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE						4,021,086
TOTAL BWR COSTS (INSIDE COMPACT)						490,449,168

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-23 PWR Burial Costs at the South Carolina Site (2004 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	2,838,980	2,061,272	5,441,752	0	1,362,711	11,704,715
VESSEL HEAD & BOTTOM	1,808,550	2,169,760	7,160	0	0	3,985,470
UPPER CORE SUPPORT ASSM	170,740	216,976	3,580	0	54,637	445,932
UPPER SUPPORT COLUMN	157,854	216,976	35,800	0	50,513	461,143
UPPER CORE BARREL	75,177	108,488	286,408	0	36,085	506,158
UPPER CORE GRID PLATE	187,943	271,220	716,020	0	90,212	1,265,395
GUIDE TUBES	278,155	325,464	35,800	0	75,102	714,521
LOWER CORE BARREL ^(a)	1,202,832	1,735,808	4,582,528	0	577,359	8,098,527
THERMAL SHIELDS ^(a)	225,531	325,464	859,224	0	108,255	1,518,474
CORE SHROUD ^(a)	174,605	216,976	8,735,444	0	83,811	9,210,836
LOWER GRID PLATE ^(a)	187,943	271,220	1,432,040	0	90,212	1,981,415
LOWER SUPPORT COLUMN	47,678	54,244	143,204	0	22,886	268,012
LOWER CORE FORGING	518,017	596,684	895,000	0	248,648	2,258,349
MISC INTERNALS	420,000	433,952	716,000	0	201,600	1,771,552
BIO SHIELD CONCRETE	10,237,500	0	429,600	0	0	10,667,100
REACTOR CAVITY LINER	206,176	0	3,580	0	0	209,756
REACTOR COOLANT PUMPS	3,589,296	0	27,802	0	0	3,617,098
PRESSURIZER	1,628,835	0	1,815	0	0	1,630,650
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	150,354	0	4,221	0	0	154,575
PRESSURIZER RELIEF TANK	451,062	0	1,446	0	0	452,508
SAFETY INJECTION ACCUM TANKS	1,606,500	0	29,156	0	0	1,635,656
STEAM GENERATORS	13,135,296	0	1,575,200	0	0	14,710,496
REACTOR COOLANT PIPING	1,430,333	0	106,684	0	0	1,537,017
REMAINING CONTAM. MATLS	25,285,554	0	80,117	0	0	25,365,670
CONTAM. MATL OTHER BLDG	194,522,610	0	65,962	0	0	194,588,572
FILTER CARTRIDGES	257,742	325,464	1,790,000	0	30,929	2,404,135
SPENT RESINS	945,000	1,084,880	2,864,080	0	453,600	5,347,560
COMBUSTIBLE WASTES	4,510,620	3,254,640	107,400	0	0	7,872,660
EVAPORATOR BOTTOMS	4,441,500	5,098,936	13,461,176	0	606,690	23,608,302
POST-TMI-2 ADDITIONS	8,913,864	0	0	0	0	8,913,864
SUBTOTAL PWR COSTS	279,606,246	18,768,424	44,438,198	0	4,093,250	346,906,118
ATLANTIC COMPACT SURCHARGE						3,883,482
TOTAL PWR COSTS (INSIDE COMPACT)						350,789,600

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-24 BWR Burial Costs at the South Carolina Site (2004 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	174,477	1,518,832	2,004,856	0	83,749	3,781,915
FUEL SUPPORT & PIECES	76,852	759,416	250,600	0	36,889	1,123,757
CONTROL RODS/INCORES	228,816	433,952	1,145,632	0	109,832	1,918,232
CONTROL RODS GUIDES	64,318	650,928	35,800	0	23,798	774,844
JET PUMPS	186,063	2,169,760	2,864,080	0	89,310	5,309,213
TOP FUEL GUIDES	318,750	3,905,568	10,310,688	0	153,000	14,688,007
CORE SUPPORT PLATE	213,675	1,681,564	232,700	0	79,060	2,206,999
CORE SHROUD ^(a)	623,969	7,594,160	20,048,560	0	299,505	28,566,194
REACTOR VESSEL WALL	135,741	1,193,368	773,280	0	50,224	2,152,614
SAC SHIELD (NEUTRON ACTIV. MATL)	2,856,173	0	60,144	0	0	2,916,317
REACTOR WATER REC	1,235,742	0	15,733	0	0	1,251,475
SAC SHIELD (CONTAM. MATL)	7,396,623	0	55,420	0	0	7,452,043
OTHER PRIMARY CONTAINMENT	51,877,142	0	632,107	0	0	52,509,249
CONTAINMENT ATMOSPHERIC	637,125	0	8,580	0	0	645,705
HIGH PRESSURE CORE SPRAY	320,250	0	3,037	0	0	323,287
LOW PRESSURE CORE SPRAY	141,746	0	1,787	0	0	143,533
REACTOR BLDG CLOSED COOLING	499,844	0	5,720	0	0	505,564
REACTOR CORE ISO COOLING	172,531	0	2,324	0	0	174,855
RESIDUAL HEAT REMOVAL	966,011	0	11,086	0	0	977,097
POOL LINER & RACKS	6,371,167	0	68,111	0	0	6,439,278
CONTAMINATED CONCRETE	7,026,349	0	77,587	0	0	7,103,936
OTHER REACTOR BUILDING	18,835,597	0	253,663	0	0	19,089,260
TURBINE	23,569,241	0	251,344	0	0	23,820,586
NUCLEAR STEAM CONDENSATE	4,818,470	0	64,891	0	0	4,883,361
LOW PRESSURE FEEDWATER HEATERS	10,460,855	0	131,747	0	0	10,592,602
MAIN STEAM	942,720	0	12,696	0	0	955,415
MOISTURE SEPARATOR REHEATERS	9,491,096	0	127,819	0	0	9,618,915
REACTOR FEEDWATER PUMPS	2,575,188	0	34,681	0	0	2,609,869
HIGH PRESSURE FEEDWATER HEATERS	1,697,388	0	21,630	0	0	1,719,018
OTHER TG BLDG	64,471,795	0	868,255	0	0	65,340,050
RAD WASTE BLDG	31,924,289	0	429,931	0	0	32,354,220
REACTOR BLDG	8,161,158	3,471,616	68,020	0	0	11,700,794
TG BLDG	5,369,183	2,278,248	44,750	0	0	7,692,181
RAD WASTE & CONTROL	4,939,648	2,061,272	41,170	0	0	7,042,090
CONCENTRATOR BOTTOMS	18,254,169	12,204,900	32,220,900	0	2,472,831	65,152,801
OTHER	4,948,908	3,308,884	343,322	0	123,317	8,724,431
POST-TMI-2 ADDITIONS	728,551	0	0	0	0	728,551
SUBTOTAL BWR COSTS	292,711,621	43,232,468	73,522,651	0	3,521,516	412,988,255
ATLANTIC COMPACT SURCHARGE						4,021,086
TOTAL BWR COSTS (INSIDE COMPACT)						417,009,341

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-25 PWR Burial Costs at the Texas Site (2016 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	IRRADIATED HARDWARE HANDLE SURCHARGE	CASK HANDLE SURCHARGE	WEIGHT SURCHARGE	CURIE CHARGE	DOSE RATE SURCHARGE	DISPOSAL COST
VESSEL WALL	684,000	2,850,000	95,000	380,000	8,360,000	1,140,000	13,509,000
VESSEL HEAD & BOTTOM	720,000	3,000,000	100,000	0	11,000	0	3,831,000
UPPER CORE SUPPORT ASSM	72,000	300,000	10,000	0	5,500	80,000	467,500
UPPER SUPPORT COLUMN	72,000	300,000	10,000	0	55,000	80,000	517,000
UPPER CORE BARREL	200,000	150,000	5,000	0	440,000	60,000	855,000
UPPER CORE GRID PLATE	500,000	375,000	12,500	0	1,100,000	150,000	2,137,500
GUIDE TUBES	108,000	450,000	15,000	0	55,000	60,000	688,000
LOWER CORE BARREL ^(a)	3,200,000	2,400,000	80,000	0	7,040,000	960,000	13,680,000
THERMAL SHIELDS ^(a)	600,000	450,000	15,000	0	1,320,000	180,000	2,565,000
CORE SHROUD ^(a)	400,000	300,000	10,000	0	13,420,000	120,000	14,250,000
LOWER GRID PLATE ^(a)	500,000	375,000	12,500	0	2,200,000	150,000	3,237,500
LOWER SUPPORT COLUMN	100,000	75,000	2,500	0	220,000	30,000	427,500
LOWER CORE FORGING	1,100,000	825,000	27,500	0	1,375,000	330,000	3,657,500
MISC INTERNALS	800,000	600,000	20,000	80,000	1,100,000	240,000	2,840,000
BIO SHIELD CONCRETE	2,496,000	0	0	490,000	1,100,000	0	4,086,000
REACTOR CAVITY LINER	51,200	0	0	0	5,500	0	56,700
REACTOR COOLANT PUMPS	420,000	0	0	240,000	42,713	0	702,713
PRESSURIZER	360,000	0	0	80,000	2,789	0	442,789
R.Hx,EHx,SUMP PUMP, CAVITY PUMP	40,000	0	0	0	6,485	0	46,485
PRESSURIZER RELIEF TANK	120,000	0	0	20,000	2,222	0	142,222
SAFETY INJECTION ACCUM TANKS	400,000	0	0	80,000	44,792	0	524,792
STEAM GENERATORS	2,136,200	0	0	640,000	2,420,000	0	5,196,200
REACTOR COOLANT PIPING	330,000	0	0	70,000	163,900	0	563,900
REMAINING CONTAM. MATLS	5,260,800	0	0	0	123,085	0	5,383,885
CONTAMINATED MATRL OTHR BLD	47,711,100	0	0	0	101,338	0	47,812,438
FILTER CARTRIDGES	315,000	0	15,000	0	1,320,000	31,500	1,681,500
SPENT RESINS	2,000,000	0	50,000	0	4,400,000	600,000	7,050,000
COMBUSTIBLE WASTES - CLASS A	697,500	0	0	0	127,875	0	825,375
COMBUSTIBLE WASTES - CLASS B	3,150,000	0	150,000	0	288,750	315,000	3,903,750
EVAPORATOR BOTTOMS	1,692,000	0	235,000	0	7,592,750	890,000	10,409,750
POST-TMI-2 ADDITIONS	1,555,608	0	0	0	0	0	1,555,608
SUBTOTAL PWR COSTS	77,791,408	12,450,000	865,000	2,080,000	54,443,697	5,416,500	153,046,605
OUT-OF-COMPACT TAXES & FEES (% OF CHARGES)							0
TOTAL PWR COSTS							153,046,605

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-26 BWR Burial Costs at the Texas Site (2016 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	IRRADIATED HARDWARE HANDLE SURCHARGE	CASK HANDLE SURCHARGE	WEIGHT SURCHARGE	CURIE CHARGE	DOSE RATE SURCHARGE	DISPOSAL COST
STEAM SEPARATOR	353,146	1,050,000	70,000	0	3,083,000	141,258	4,697,404
FUEL SUPPORT & PIECES	176,573	525,000	35,000	0	385,185	52,972	1,174,730
CONTROL RODS/INCORES	529,719	600,000	20,000	0	1,802,000	211,888	3,163,607
CONTROL RODS GUIDES	25,427	450,000	30,000	0	55,030	28,252	588,708
JET PUMPS	494,404	1,500,000	100,000	0	4,412,880	197,762	6,705,046
TOP FUEL GUIDES	847,550	5,400,000	180,000	0	15,928,800	339,020	22,695,371
CORE SUPPORT PLATE	69,923	1,200,000	77,500	0	357,610	77,692	1,782,725
CORE SHROUD ^(a)	1,659,786	10,500,000	350,000	0	33,479,000	663,914	46,652,701
REACTOR VESSEL WALL	50,853	1,500,000	55,000	0	1,188,014	56,503	2,850,371
SAC SHIELD Neutron-Activated Matl	317,831	0	0	140,000	93,506	0	551,338
REACT. WATER REC	310,768	0	0	50,000	24,173	0	384,942
SAC SHIELD Contaminated Matl	1,094,753	0	0	380,000	85,156	0	1,559,909
OTHER PRIMARY CONTAINMENT	12,487,243	0	0	0	971,327	0	13,458,570
CONTAINM. ATMOSPHERIC	169,510	0	0	10,000	13,185	0	192,696
HIGH PRESSURE CORE SPRAY	60,035	0	0	20,000	4,670	0	84,705
LOW PRESSURE CORE SPRAY	35,315	0	0	10,000	2,747	0	48,062
REACTOR BLDG CLOSED COOLING	113,007	0	0	0	8,790	0	121,797
REACTOR CORE ISO COOLING	45,909	0	0	0	3,571	0	49,480
RESIDUAL HEAT REMOVAL	218,951	0	0	50,000	17,031	0	285,982
POOL LINER & RACKS	1,345,486	0	0	180,000	104,659	0	1,630,146
CONTAMINATED CONCRETE	1,532,654	0	0	280,000	119,218	0	1,931,872
OTHER REACTOR BUILDING	5,011,142	0	0	0	389,794	0	5,400,936
TURBINE	4,965,233	0	0	820,000	386,223	0	6,171,456
NUCLEAR STEAM CONDENSATE	1,281,920	0	0	130,000	99,715	0	1,511,635
LOW PRESSURE FEEDWATER HEATERS	2,602,686	0	0	420,000	202,451	0	3,225,137
MAIN STEAM	250,734	0	0	20,000	19,503	0	290,237
MOISTURE SEPARATOR REHEATERS	2,524,994	0	0	260,000	196,408	0	2,981,402
REACTOR FEEDWATER PUMPS	685,103	0	0	60,000	53,291	0	798,394
HIGH PRESSURE FEEDWATER HEATERS	427,307	0	0	80,000	33,238	0	540,545
OTHER TG BLDG	17,152,301	0	0	0	1,334,201	0	18,486,502
RAD WASTE BLDG	8,493,161	0	0	0	660,645	0	9,153,807
REACTOR BLDG - CLASS A	730,483	0	0	0	135,438	0	865,920
REACTOR BLDG - CLASS B	3,285,317	0	160,000	0	304,563	328,532	4,078,411
TG BLDG - CLASS A	493,168	0	0	0	91,438	0	584,606
TG BLDG - CLASS B	2,217,404	0	105,000	0	205,563	221,740	2,749,707
RAD WASTE & CONTROL - CLASS A	425,682	0	0	0	78,925	0	504,607
RAD WASTE & CONTROL - CLASS B	1,913,345	0	95,000	0	177,375	191,335	2,377,055
CONCENTRATOR BOTTOMS - CLASS A	3,127,461	0	432,500	1,730,000	798,600	2,129,164	8,217,725
CONCENTRATOR BOTTOMS - CLASS B	5,226,561	0	130,000	520,000	11,440,000	640,480	17,957,041
OTHER	1,106,053	0	152,500	610,000	180,950	191,394	2,240,897
POST-TMI-2 ADDITIONS	127,133	0	0	0	0	0	127,133
SUBTOTAL BWR COSTS	83,986,029	22,725,000	1,992,500	5,770,000	78,927,875	5,471,906	198,873,311
OUT-OF-COMPACT TAXES & FEES (% OF CHARGES)							0
TOTAL PWR COSTS							198,873,311

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-27 PWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the Washington Disposal Facility (2016 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	0	0	0	0	748,220	748,220
VESSEL HEAD & BOTTOM	0	0	0	0	1,667,600	1,667,600
UPPER CORE SUPPORT ASSM	0	0	0	0	78,760	78,760
UPPER SUPPORT COLUMN	0	0	0	0	78,760	78,760
UPPER CORE BARREL	18,240	27,020	15,580	20,100	0	80,940
UPPER CORE GRID PLATE	45,600	67,550	38,950	50,250	0	202,350
GUIDE TUBES	0	0	0	0	118,140	118,140
LOWER CORE BARREL ^(a)	291,840	432,320	249,280	321,600	0	1,295,040
THERMAL SHIELDS ^(a)	54,720	81,060	46,740	60,300	0	242,820
CORE SHROUD ^(a)	36,480	54,040	31,160	40,200	0	161,880
LOWER GRID PLATE ^(a)	45,600	67,550	38,950	50,250	0	202,350
LOWER SUPPORT COLUMN	9,120	13,510	7,790	10,050	0	40,470
LOWER CORE FORGING	100,320	148,610	85,690	110,550	0	445,170
MISC INTERNALS	72,960	108,080	62,320	80,400	0	323,760
BIO SHIELD CONCRETE	0	0	0	0	4,914,624	4,914,624
REACTOR CAVITY LINER	0	0	0	0	100,813	100,813
REACTOR COOLANT PUMPS	0	0	0	0	1,750,980	1,750,980
PRESSURIZER	0	0	0	0	1,500,840	1,500,840
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	0	0	0	0	78,760	78,760
PRESSURIZER RELIEF TANK	0	0	0	0	236,280	236,280
SAFETY INJECTION ACCUM TANKS	0	0	0	0	787,600	787,600
STEAM GENERATORS	0	0	0	0	8,905,818	8,905,818
REACTOR COOLANT PIPING	0	0	0	0	649,770	649,770
REMAINING CONTAM. MATLS	0	0	0	0	10,358,515	10,358,515
CONTAMINATED MATRL OTHR BLD	0	0	0	0	93,943,156	93,943,156
FILTER CARTRIDGES	28,728	81,060	327,180	283,500	0	720,468
SPENT RESINS	182,400	270,200	155,800	201,000	0	809,400
COMBUSTIBLE WASTES – CLASS A	0	0	0	0	4,772,295	4,772,295
COMBUSTIBLE WASTES – CLASS B	287,280	405,300	3,271,800	716,520	0	4,680,900
EVAPORATOR BOTTOMS	0	0	0	0	1,933,839	1,933,839
POST-TMI-2 ADDITIONS	0	0	0	0	3,062,992	3,062,992
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES						422,517
SUBTOTAL PWR COSTS	1,173,288	1,756,300	4,331,240	1,944,720	135,687,762	145,315,827
TAXES & FEES (% OF CHARGES)						414,007
TAXES & FEES (\$/UNIT VOL.)						372,126
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						146,229,160

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-28 BWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the Washington Disposal Facility (2016 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	32,207	189,140	218,120	836,293	0	1,275,759
FUEL SUPPORT & PIECES	16,103	94,570	109,060	140,700	0	360,433
CONTROL RODS/INCORES	48,310	108,080	62,320	836,293	0	1,055,003
CONTROL RODS GUIDES	0	0	0	0	27,814	27,814
JET PUMPS	45,090	270,200	311,600	695,593	0	1,322,482
TOP FUEL GUIDES	77,297	972,720	560,880	0	0	1,610,897
CORE SUPPORT PLATE	0	0	0	0	76,488	76,488
CORE SHROUD ^(a)	151,373	1,891,400	1,090,600	0	0	3,133,373
REACTOR VESSEL WALL	0	0	0	0	55,628	55,628
SAC SHIELD Neutron-Activated Matl	0	0	0	0	625,810	625,810
REACT. WATER REC	0	0	0	0	611,903	611,903
SAC SHIELD Contaminated Matl	0	0	0	0	2,155,568	2,155,568
OTHER PRIMARY CONTAINMENT	0	0	0	0	24,587,381	24,587,381
CONTAINM. ATMOSPHERIC	0	0	0	0	333,765	333,765
HIGH PRESSURE CORE SPRAY	0	0	0	0	118,209	118,209
LOW PRESSURE CORE SPRAY	0	0	0	0	69,534	69,534
REACTOR BLDG CLOSED COOLING	0	0	0	0	222,510	222,510
REACTOR CORE ISO COOLING	0	0	0	0	90,395	90,395
RESIDUAL HEAT REMOVAL	0	0	0	0	431,114	431,114
POOL LINER & RACKS	0	0	0	0	2,649,262	2,649,262
CONTAMINATED CONCRETE	0	0	0	0	3,017,795	3,017,795
OTHER REACTOR BUILDING	0	0	0	0	9,866,938	9,866,938
TURBINE	0	0	0	0	20,700,055	20,700,055
NUCLEAR STEAM CONDENSATE	0	0	0	0	2,524,100	2,524,100
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	5,124,689	5,124,689
MAIN STEAM	0	0	0	0	493,695	493,695
MOISTURE SEPARATOR REHEATERS	0	0	0	0	4,971,713	4,971,713
REACTOR FEEDWATER PUMPS	0	0	0	0	2,856,195	2,856,195
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	841,367	841,367
OTHER TG BLDG	0	0	0	0	33,772,881	33,772,881
RAD WASTE BLDG	0	0	0	0	16,723,035	16,723,035
REACTOR BLDG – CLASS A	0	0	0	0	1,438,320	1,438,320
REACTOR BLDG – CLASS B	299,621	432,320	3,450,970	0	0	4,182,911
TG BLDG – CLASS A	0	0	0	0	971,049	971,049
TG BLDG – CLASS B	202,227	283,710	2,329,210	0	0	2,815,147
RAD WASTE & CONTROL – CLASS A	0	0	0	0	838,168	838,168
RAD WASTE & CONTROL – CLASS B	174,497	256,690	2,009,820	0	0	2,441,007
CONCENTRATOR BOTTOMS – CLASS A	0	0	0	0	477,807	477,807
CONCENTRATOR BOTTOMS – CLASS B	476,662	702,520	405,080	0	0	1,584,262
OTHER	0	0	0	0	1,209,899	1,209,899
POST-TMI-2 ADDITIONS	0	0	0	0	250,324	250,324
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES						422,517
SUBTOTAL BWR COSTS	1,523,387	5,201,350	10,547,660	2,508,878	138,133,410	158,337,202
TAXES & FEES (% OF CHARGES)						868,763
TAXES & FEES (\$/UNIT VOL.)						572,105
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL BWR COSTS						159,905,270

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-29 PWR LLW Disposition Costs Using a Combination of Non-Compact Facility and the South Carolina Disposal Facility (2016 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
VESSEL WALL	0	0	0	0	0	748,220	748,220
VESSEL HEAD & BOTTOM	0	0	0	0	0	1,667,600	1,667,600
UPPER CORE SUPPORT ASSM	0	0	0	0	0	78,760	78,760
UPPER SUPPORT COLUMN	0	0	0	0	0	78,760	78,760
UPPER CORE BARREL	119,547	172,506	456,902	0	57,383	0	806,338
UPPER CORE GRID PLATE	298,868	431,265	1,142,255	0	143,456	0	2,015,844
GUIDE TUBES	0	0	0	0	0	118,140	118,140
LOWER CORE BARREL ^(a)	1,912,752	2,760,096	7,310,432	0	918,121	0	12,901,401
THERMAL SHIELDS ^(a)	358,641	517,518	1,370,706	0	172,148	0	2,419,013
CORE SHROUD ^(a)	277,667	345,012	13,935,511	0	133,280	0	14,691,470
LOWER GRID PLATE ^(a)	298,868	431,265	2,284,510	0	143,456	0	3,158,099
LOWER SUPPORT COLUMN	75,820	86,253	228,451	0	36,394	0	426,918
LOWER CORE FORGING	823,778	948,783	1,422,500	0	395,414	0	3,590,475
MISC INTERNALS	667,840	690,024	1,138,000	0	320,563	0	2,816,427
BIO SHIELD CONCRETE	0	0	0	0	0	4,914,624	4,914,624
REACTOR CAVITY LINER	0	0	0	0	0	100,813	100,813
REACTOR COOLANT PUMPS	0	0	0	0	0	1,750,980	1,750,980
PRESSURIZER	0	0	0	0	0	1,500,840	1,500,840
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	0	0	0	0	0	78,760	78,760
PRESSURIZER RELIEF TANK	0	0	0	0	0	236,280	236,280
SAFETY INJECTION ACCUM TANKS	0	0	0	0	0	787,600	787,600
STEAM GENERATORS	0	0	0	0	0	8,905,818	8,905,818
REACTOR COOLANT PIPING	0	0	0	0	0	649,770	649,770
REMAINING CONTAM. MATLS	0	0	0	0	0	10,358,515	10,358,515
CONTAMINATED MATRL OTHR BLD	0	0	0	0	0	93,943,156	93,943,156
FILTER CARTRIDGES	409,806	517,518	1,370,706	0	49,177	0	2,347,207
SPENT RESINS	1,502,640	1,725,060	4,569,020	0	721,267	0	8,517,987
COMBUSTIBLE WASTES – CLASS A	0	0	0	0	0	4,772,295	4,772,295
COMBUSTIBLE WASTES – CLASS B	2,253,960	5,175,180	298,725	0	180,317	0	7,908,182
EVAPORATOR BOTTOMS	0	0	0	0	0	1,933,839	1,933,839
POST-TMI-2 ADDITIONS	0	0	0	0	0	3,062,992	3,062,992
SUBTOTAL PWR COSTS	9,000,186	13,800,480	35,527,718	0	3,270,975	135,687,762	197,287,121
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE							77,190
TOTAL PWR COSTS (INSIDE COMPACT)							197,364,311

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-30 BWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the South Carolina Disposal Facility (2016 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
STEAM SEPARATOR	278,198	2,415,084	3,198,314	0	133,535	0	6,025,131
FUEL SUPPORT & PIECES	122,430	1,207,542	398,300	0	58,766	0	1,787,038
CONTROL RODS/INCORES	364,587	690,024	1,827,608	0	175,002	0	3,057,221
CONTROL RODS GUIDES	0	0	0	0	0	27,814	27,814
JET PUMPS	295,523	3,450,120	4,569,020	0	141,851	0	8,456,514
TOP FUEL GUIDES	506,611	6,210,216	16,448,472	0	243,173	0	23,408,472
CORE SUPPORT PLATE	0	0	0	0	0	76,488	76,488
CORE SHROUD ^(a)	992,112	12,075,420	31,983,140	0	476,214	0	45,526,886
REACTOR VESSEL WALL	0	0	0	0	0	55,628	55,628
SAC SHIELD Neutron-Activated Matl	0	0	0	0	0	625,810	625,810
REACT. WATER REC	0	0	0	0	0	611,903	611,903
SAC SHIELD Contaminated Matl	0	0	0	0	0	2,155,568	2,155,568
OTHER PRIMARY CONTAINMENT	0	0	0	0	0	24,587,381	24,587,381
CONTAINM. ATMOSPHERIC	0	0	0	0	0	333,765	333,765
HIGH PRESSURE CORE SPRAY	0	0	0	0	0	118,209	118,209
LOW PRESSURE CORE SPRAY	0	0	0	0	0	69,534	69,534
REACTOR BLDG CLOSED COOLING	0	0	0	0	0	222,510	222,510
REACTOR CORE ISO COOLING	0	0	0	0	0	90,395	90,395
RESIDUAL HEAT REMOVAL	0	0	0	0	0	431,114	431,114
POOL LINER & RACKS	0	0	0	0	0	2,649,262	2,649,262
CONTAMINATED CONCRETE	0	0	0	0	0	3,017,795	3,017,795
OTHER REACTOR BUILDING	0	0	0	0	0	9,866,938	9,866,938
TURBINE	0	0	0	0	0	20,700,055	20,700,055
NUCLEAR STEAM CONDENSATE	0	0	0	0	0	2,524,100	2,524,100
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	0	5,124,689	5,124,689
MAIN STEAM	0	0	0	0	0	493,695	493,695
MOISTURE SEPARATOR REHEATERS	0	0	0	0	0	4,971,713	4,971,713
REACTOR FEEDWATER PUMPS	0	0	0	0	0	2,856,195	2,856,195
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	0	841,367	841,367
OTHER TG BLDG	0	0	0	0	0	33,772,881	33,772,881
RAD WASTE BLDG	0	0	0	0	0	16,723,035	16,723,035
REACTOR BLDG – CLASS A	0	0	0	0	0	1,438,320	1,438,320
REACTOR BLDG – CLASS B	10,927,273	5,520,192	315,084	0	874,182	0	17,636,731
TG BLDG – CLASS A	0	0	0	0	0	971,049	971,049
TG BLDG – CLASS B	7,171,023	3,622,626	212,664	0	573,682	0	11,579,995
RAD WASTE & CONTROL – CLASS A	0	0	0	0	0	838,168	838,168
RAD WASTE & CONTROL – CLASS B	6,488,068	3,277,614	183,503	0	519,045	0	10,468,230
CONCENTRATOR BOTTOMS – CLASS A	0	0	0	0	0	477,807	477,807
CONCENTRATOR BOTTOMS – CLASS B	6,707,745	4,485,156	11,879,452	0	1,181,804	0	24,254,157
OTHER	0	0	0	0	0	1,209,899	1,209,899
POST-TMI-2 ADDITIONS	0	0	0	0	0	250,324	250,324
SUBTOTAL BWR COSTS	33,853,570	42,953,994	71,015,556	0	4,377,254	138,133,410	290,333,784
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE							100,223
TOTAL BWR COSTS (INSIDE COMPACT)							290,434,007

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-31 PWR LLW Disposition Costs Using a Combination of Non-Compact Facility and the Texas Disposal Facility (2016 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	IRRADIATED HARDWARE HANDLE SURCHARGE	CASK HANDLE SURCHARGE	WEIGHT SURCHARGE	CURIE CHARGE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
VESSEL WALL	0	0	0	0	0	0	748,220	748,220
VESSEL HEAD & BOTTOM	0	0	0	0	0	0	1,667,600	1,667,600
UPPER CORE SUPPORT ASSM	0	0	0	0	0	0	78,760	78,760
UPPER SUPPORT COLUMN	0	0	0	0	0	0	78,760	78,760
UPPER CORE BARREL	200,000	150,000	5,000	0	440,000	60,000	0	855,000
UPPER CORE GRID PLATE	500,000	375,000	12,500	0	1,100,000	150,000	0	2,137,500
GUIDE TUBES	0	0	0	0	0	0	118,140	118,140
LOWER CORE BARREL ^(a)	3,200,000	2,400,000	80,000	0	7,040,000	960,000	0	13,680,000
THERMAL SHIELDS ^(a)	600,000	450,000	15,000	0	1,320,000	180,000	0	2,565,000
CORE SHROUD ^(a)	400,000	300,000	10,000	0	13,420,000	120,000	0	14,250,000
LOWER GRID PLATE ^(a)	500,000	375,000	12,500	0	2,200,000	150,000	0	3,237,500
LOWER SUPPORT COLUMN	100,000	75,000	2,500	0	220,000	30,000	0	427,500
LOWER CORE FORGING	1,100,000	825,000	27,500	0	1,375,000	330,000	0	3,657,500
MISC INTERNALS	800,000	600,000	20,000	80,000	1,100,000	240,000	0	2,840,000
BIO SHIELD CONCRETE	0	0	0	0	0	0	4,914,624	4,914,624
REACTOR CAVITY LINER	0	0	0	0	0	0	100,813	100,813
REACTOR COOLANT PUMPS	0	0	0	0	0	0	1,750,980	1,750,980
PRESSURIZER	0	0	0	0	0	0	1,500,840	1,500,840
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	0	0	0	0	0	0	78,760	78,760
PRESSURIZER RELIEF TANK	0	0	0	0	0	0	236,280	236,280
SAFETY INJECTION ACCUM TANKS	0	0	0	0	0	0	787,600	787,600
STEAM GENERATORS	0	0	0	0	0	0	8,905,818	8,905,818
REACTOR COOLANT PIPING	0	0	0	0	0	0	649,770	649,770
REMAINING CONTAM. MATLS	0	0	0	0	0	0	10,358,515	10,358,515
CONTAMINATED MATRL OTHR BLD	0	0	0	0	0	0	93,943,156	93,943,156
FILTER CARTRIDGES	315,000	0	15,000	0	1,320,000	31,500	0	1,681,500
SPENT RESINS	2,000,000	0	50,000	0	4,400,000	600,000	0	7,050,000
COMBUSTIBLE WASTES – CLASS A	0	0	0	0	0	0	4,772,295	4,772,295
COMBUSTIBLE WASTES – CLASS B	3,150,000	0	150,000	0	288,750	315,000	0	3,903,750
EVAPORATOR BOTTOMS	0	0	0	0	0	0	1,933,839	1,933,839
POST-TMI-2 ADDITIONS	0	0	0	0	0	0	3,062,992	3,062,992
SUBTOTAL PWR COSTS	12,865,000	5,550,000	400,000	80,000	34,223,750	3,166,500	135,687,762	191,973,012

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-32 BWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the Texas Disposal Facility (2016 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	IRRADIATED HARDWARE HANDLE SURCHARGE	CASK HANDLE SURCHARGE	WEIGHT SURCHARGE	CURIE CHARGE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
STEAM SEPARATOR	353,146	1,050,000	70,000	0	3,083,000	141,258	0	4,697,404
FUEL SUPPORT & PIECES	176,573	525,000	35,000	0	385,185	52,972	0	1,174,730
CONTROL RODS/INCORES	529,719	600,000	20,000	0	1,802,000	211,888	0	3,163,607
CONTROL RODS GUIDES	0	0	0	0	0	0	27,814	27,814
JET PUMPS	494,404	1,500,000	100,000	0	4,412,880	197,762	0	6,705,046
TOP FUEL GUIDES	847,550	5,400,000	180,000	0	15,928,800	339,020	0	22,695,371
CORE SUPPORT PLATE	0	0	0	0	0	0	76,488	76,488
CORE SHROUD ^(a)	1,659,786	10,500,000	350,000	0	33,479,000	663,914	0	46,652,701
REACTOR VESSEL WALL	0	0	0	0	0	0	55,628	55,628
SAC SHIELD Neutron-Activated Matl	0	0	0	0	0	0	625,810	625,810
REACT. WATER REC	0	0	0	0	0	0	611,903	611,903
SAC SHIELD Contaminated Matl	0	0	0	0	0	0	2,155,568	2,155,568
OTHER PRIMARY CONTAINMENT	0	0	0	0	0	0	24,587,381	24,587,381
CONTAINM. ATMOSPHERIC	0	0	0	0	0	0	333,765	333,765
HIGH PRESSURE CORE SPRAY	0	0	0	0	0	0	118,209	118,209
LOW PRESSURE CORE SPRAY	0	0	0	0	0	0	69,534	69,534
REACTOR BLDG CLOSED COOLING	0	0	0	0	0	0	222,510	222,510
REACTOR CORE ISO COOLING	0	0	0	0	0	0	90,395	90,395
RESIDUAL HEAT REMOVAL	0	0	0	0	0	0	431,114	431,114
POOL LINER & RACKS	0	0	0	0	0	0	2,649,262	2,649,262
CONTAMINATED CONCRETE	0	0	0	0	0	0	3,017,795	3,017,795
OTHER REACTOR BUILDING	0	0	0	0	0	0	9,866,938	9,866,938
TURBINE	0	0	0	0	0	0	20,700,055	20,700,055
NUCLEAR STEAM CONDENSATE	0	0	0	0	0	0	2,524,100	2,524,100
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	0	0	5,124,689	5,124,689
MAIN STEAM	0	0	0	0	0	0	493,695	493,695
MOISTURE SEPARATOR REHEATERS	0	0	0	0	0	0	4,971,713	4,971,713
REACTOR FEEDWATER PUMPS	0	0	0	0	0	0	2,856,195	2,856,195
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	0	0	841,367	841,367
OTHER TG BLDG	0	0	0	0	0	0	33,772,881	33,772,881
RAD WASTE BLDG	0	0	0	0	0	0	16,723,035	16,723,035
REACTOR BLDG – CLASS A	0	0	0	0	0	0	1,438,320	1,438,320
REACTOR BLDG – CLASS B	3,285,317	0	160,000	0	304,563	328,532	0	4,078,411
TG BLDG – CLASS A	0	0	0	0	0	0	971,049	971,049
TG BLDG – CLASS B	2,217,404	0	105,000	0	205,563	221,740	0	2,749,707
RAD WASTE & CONTROL – CLASS A	0	0	0	0	0	0	838,168	838,168
RAD WASTE & CONTROL – CLASS B	1,913,345	0	95,000	0	177,375	191,335	0	2,377,055
CONCENTRATOR BOTTOMS – CLASS A	0	0	0	0	0	0	477,807	477,807
CONCENTRATOR BOTTOMS – CLASS B	5,226,561	0	130,000	520,000	11,440,000	640,480	0	17,957,041
OTHER	0	0	0	0	0	0	1,209,899	1,209,899
POST-TMI-2 ADDITIONS	0	0	0	0	0	0	250,324	250,324
SUBTOTAL BWR COSTS	16,703,806	19,575,000	1,245,000	520,000	71,218,365	2,988,901	138,133,410	250,384,482

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-33 PWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the Washington Disposal Facility (2012 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	351,120	522,500	287,280	777,649	0	1,938,549
VESSEL HEAD & BOTTOM	369,600	550,000	302,400	0	0	1,222,000
UPPER CORE SUPPORT ASSM	36,960	55,000	30,240	0	0	122,200
UPPER SUPPORT COLUMN	36,960	55,000	30,240	0	0	122,200
UPPER CORE BARREL	18,480	27,500	15,120	0	0	61,100
UPPER CORE GRID PLATE	46,200	68,750	37,800	0	0	152,750
GUIDE TUBES	55,440	82,500	45,360	0	0	183,300
LOWER CORE BARREL ^(a)	295,680	440,000	241,920	0	0	977,600
THERMAL SHIELDS ^(a)	55,440	82,500	45,360	0	0	183,300
CORE SHROUD ^(a)	36,960	55,000	30,240	0	0	122,200
LOWER GRID PLATE ^(a)	46,200	68,750	37,800	0	0	152,750
LOWER SUPPORT COLUMN	9,240	13,750	7,560	0	0	30,550
LOWER CORE FORGING	101,640	151,250	83,160	0	0	336,050
MISC INTERNALS	73,920	110,000	60,480	0	0	244,400
BIO SHIELD CONCRETE	0	0	0	0	4,530,240	4,530,240
REACTOR CAVITY LINER	47,309	13,750	30,240	0	0	91,299
REACTOR COOLANT PUMPS	0	0	0	0	1,617,000	1,617,000
PRESSURIZER	0	0	0	0	1,386,000	1,386,000
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	0	0	0	0	72,600	72,600
PRESSURIZER RELIEF TANK	0	0	0	0	217,800	217,800
SAFETY INJECTION ACCUM TANKS	0	0	0	0	726,000	726,000
STEAM GENERATORS	0	0	0	0	8,224,370	8,224,370
REACTOR COOLANT PIPING	0	0	0	0	598,950	598,950
REMAINING CONTAM. MATLS	0	0	0	0	9,548,352	9,548,352
CONTAMINATED MATRL OTHR BLD	0	0	0	0	86,595,647	86,595,647
FILTER CARTRIDGES	0	0	0	0	159,390	159,390
SPENT RESINS	184,800	275,000	151,200	0	0	611,000
COMBUSTIBLE WASTES	0	0	0	0	6,404,063	6,404,063
EVAPORATOR BOTTOMS	868,560	1,292,500	710,640	0	0	2,871,700
POST-TMI-2 ADDITIONS	1,438,021	0	0	0	0	1,438,021
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES						399,078
SUBTOTAL PWR COSTS	4,072,530	3,863,750	2,147,040	777,649	120,080,411	131,340,458
TAXES & FEES (% OF CHARGES)						484,182
TAXES & FEES (\$/UNIT VOL.)						725,794
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						132,677,634

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-34 BWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the Washington Disposal Facility (2012 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	32,631	192,500	211,680	777,649	0	1,214,460
FUEL SUPPORT & PIECES	16,315	96,250	105,840	0	0	218,405
CONTROL RODS/INCORES	48,946	110,000	60,480	0	0	219,426
CONTROL RODS GUIDES	13,052	82,500	90,720	0	0	186,272
JET PUMPS	45,683	275,000	302,400	0	0	623,083
TOP FUEL GUIDES	78,314	990,000	544,320	0	0	1,612,634
CORE SUPPORT PLATE	35,894	220,000	234,360	0	0	490,254
CORE SHROUD ^(a)	153,364	1,925,000	1,058,400	0	0	3,136,764
REACTOR VESSEL WALL	26,105	275,000	166,320	0	0	467,425
SAC SHIELD Neutron-Activated Matl	0	0	0	0	576,864	576,864
REACT. WATER REC	0	0	0	0	564,045	564,045
SAC SHIELD Contaminated Matl	0	0	0	0	1,986,976	1,986,976
OTHER PRIMARY CONTAINMENT	0	0	0	0	22,664,345	22,664,345
CONTAINM. ATMOSPHERIC	0	0	0	0	307,661	307,661
HIGH PRESSURE CORE SPRAY	0	0	0	0	108,963	108,963
LOW PRESSURE CORE SPRAY	0	0	0	0	64,096	64,096
REACTOR BLDG CLOSED COOLING	0	0	0	0	205,107	205,107
REACTOR CORE ISO COOLING	0	0	0	0	83,325	83,325
RESIDUAL HEAT REMOVAL	0	0	0	0	397,395	397,395
POOL LINER & RACKS	0	0	0	0	2,442,058	2,442,058
CONTAMINATED CONCRETE	0	0	0	0	2,781,766	2,781,766
OTHER REACTOR BUILDING	0	0	0	0	9,095,222	9,095,222
TURBINE	0	0	0	0	19,116,146	19,116,146
NUCLEAR STEAM CONDENSATE	0	0	0	0	2,326,685	2,326,685
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	4,723,875	4,723,875
MAIN STEAM	0	0	0	0	455,082	455,082
MOISTURE SEPARATOR REHEATERS	0	0	0	0	4,582,864	4,582,864
REACTOR FEEDWATER PUMPS	0	0	0	0	2,637,647	2,637,647
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	775,562	775,562
OTHER TG BLDG	0	0	0	0	31,131,427	31,131,427
RAD WASTE BLDG	0	0	0	0	15,415,088	15,415,088
REACTOR BLDG	0	0	0	0	1,922,880	1,922,880
TG BLDG	0	0	0	0	1,301,149	1,301,149
RAD WASTE & CONTROL	0	0	0	0	1,121,680	1,121,680
CONCENTRATOR BOTTOMS	2,088,364	3,093,750	1,701,000	0	0	6,883,114
OTHER	567,774	838,750	461,160	0	0	1,867,684
POST-TMI-2 ADDITIONS	117,533	0	0	0	0	117,533
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES						399,078
SUBTOTAL BWR COSTS	3,223,975	8,098,750	4,936,680	777,649	126,787,907	144,224,039
TAXES & FEES (% OF CHARGES)						749,754
TAXES & FEES (\$/UNIT VOL.)						601,878
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL BWR COSTS						145,702,871

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-35 PWR LLW Disposition Costs Using a Combination of Non-Compact Facility and the South Carolina Disposal Facility (2012 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
VESSEL WALL	4,470,517	3,246,036	8,553,154	0	2,145,848	0	18,415,555
VESSEL HEAD & BOTTOM	2,848,544	3,416,880	11,260	0	0	0	6,276,684
UPPER CORE SUPPORT ASSM	268,922	341,688	5,630	0	86,055	0	702,295
UPPER SUPPORT COLUMN	248,626	341,688	56,300	0	79,560	0	726,174
UPPER CORE BARREL	118,395	170,844	450,166	0	56,830	0	796,235
UPPER CORE GRID PLATE	295,988	427,110	1,125,415	0	142,074	0	1,990,587
GUIDE TUBES	438,062	512,532	56,300	0	118,277	0	1,125,170
LOWER CORE BARREL ^(a)	1,894,320	2,733,504	7,202,656	0	909,274	0	12,739,754
THERMAL SHIELDS ^(a)	355,185	512,532	1,350,498	0	170,489	0	2,388,704
CORE SHROUD ^(a)	275,011	341,688	13,730,063	0	132,005	0	14,478,767
LOWER GRID PLATE ^(a)	295,988	427,110	2,250,830	0	142,074	0	3,116,002
LOWER SUPPORT COLUMN	75,095	85,422	225,083	0	36,046	0	421,646
LOWER CORE FORGING	815,899	939,642	1,407,500	0	391,632	0	3,554,673
MISC INTERNALS	661,440	683,376	1,126,000	0	317,491	0	2,788,307
BIO SHIELD CONCRETE	0	0	0	0	0	4,530,240	4,530,240
REACTOR CAVITY LINER	324,736	0	5,630	0	0	0	330,366
REACTOR COOLANT PUMPS	0	0	0	0	0	1,617,000	1,617,000
PRESSURIZER	0	0	0	0	0	1,386,000	1,386,000
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	0	0	0	0	0	72,600	72,600
PRESSURIZER RELIEF TANK	0	0	0	0	0	217,800	217,800
SAFETY INJECTION ACCUM TANKS	0	0	0	0	0	726,000	726,000
STEAM GENERATORS	0	0	0	0	0	8,224,370	8,224,370
REACTOR COOLANT PIPING	0	0	0	0	0	598,950	598,950
REMAINING CONTAM. MATLS	0	0	0	0	0	9,548,352	9,548,352
CONTAMINATED MATRL OTHR BLD	0	0	0	0	0	86,595,647	86,595,647
FILTER CARTRIDGES	0	0	0	0	0	159,390	159,390
SPENT RESINS	1,488,240	1,708,440	4,501,660	0	714,355	0	8,412,695
COMBUSTIBLE WASTES	0	0	0	0	0	6,404,063	6,404,063
EVAPORATOR BOTTOMS	6,994,728	8,029,668	21,157,802	0	955,450	0	37,137,648
POST-TMI-2 ADDITIONS	14,036,581	0	0	0	0	0	14,036,581
SUBTOTAL PWR COSTS	35,906,275	23,918,160	63,215,947	0	6,397,459	120,080,411	249,518,252
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE							264,450
TOTAL PWR COSTS (INSIDE COMPACT)							249,782,702

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-36 BWR LLW Disposition Costs Using a Combination of Non-Compact Disposal Facility and the South Carolina Disposal Facility (2012 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
STEAM SEPARATOR	275,517	2,391,816	3,151,162	0	132,248	0	5,950,743
FUEL SUPPORT & PIECES	121,259	1,195,908	394,100	0	58,204	0	1,769,471
CONTROL RODS/INCORES	361,093	683,376	1,800,664	0	173,325	0	3,018,458
CONTROL RODS GUIDES	101,506	1,025,064	56,300	0	37,557	0	1,220,428
JET PUMPS	292,675	3,416,880	4,501,660	0	140,484	0	8,351,699
TOP FUEL GUIDES	501,729	6,150,384	16,205,976	0	240,830	0	23,098,918
CORE SUPPORT PLATE	337,215	2,648,082	365,950	0	124,769	0	3,476,016
CORE SHROUD ^(a)	982,552	11,959,080	31,511,620	0	471,625	0	44,924,877
REACTOR VESSEL WALL	213,878	1,879,284	1,216,080	0	79,135	0	3,388,377
SAC SHIELD Neutron-Activated Matl	0	0	0	0	0	576,864	576,864
REACT. WATER REC	0	0	0	0	0	564,045	564,045
SAC SHIELD Contaminated Matl	0	0	0	0	0	1,986,976	1,986,976
OTHER PRIMARY CONTAINMENT	0	0	0	0	0	22,664,345	22,664,345
CONTAINM. ATMOSPHERIC	0	0	0	0	0	307,661	307,661
HIGH PRESSURE CORE SPRAY	0	0	0	0	0	108,963	108,963
LOW PRESSURE CORE SPRAY	0	0	0	0	0	64,096	64,096
REACTOR BLDG CLOSED COOLING	0	0	0	0	0	205,107	205,107
REACTOR CORE ISO COOLING	0	0	0	0	0	83,325	83,325
RESIDUAL HEAT REMOVAL	0	0	0	0	0	397,395	397,395
POOL LINER & RACKS	0	0	0	0	0	2,442,058	2,442,058
CONTAMINATED CONCRETE	0	0	0	0	0	2,781,766	2,781,766
OTHER REACTOR BUILDING	0	0	0	0	0	9,095,222	9,095,222
TURBINE	0	0	0	0	0	19,116,146	19,116,146
NUCLEAR STEAM CONDENSATE	0	0	0	0	0	2,326,685	2,326,685
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	0	4,723,875	4,723,875
MAIN STEAM	0	0	0	0	0	455,082	455,082
MOISTURE SEPARATOR REHEATERS	0	0	0	0	0	4,582,864	4,582,864
REACTOR FEEDWATER PUMPS	0	0	0	0	0	2,637,647	2,637,647
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	0	775,562	775,562
OTHER TG BLDG	0	0	0	0	0	31,131,427	31,131,427
RAD WASTE BLDG	0	0	0	0	0	15,415,088	15,415,088
REACTOR BLDG	0	0	0	0	0	1,922,880	1,922,880
TG BLDG	0	0	0	0	0	1,301,149	1,301,149
RAD WASTE & CONTROL	0	0	0	0	0	1,121,680	1,121,680
CONCENTRATOR BOTTOMS	28,744,710	19,219,950	50,643,675	0	3,893,950	0	102,502,285
OTHER	7,793,010	5,210,742	539,917	0	194,186	0	13,737,856
POST-TMI-2 ADDITIONS	1,147,242	0	0	0	0	0	1,147,242
SUBTOTAL BWR COSTS	40,872,386	55,780,566	110,387,104	0	5,546,314	126,787,907	339,374,278
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE							209,349
TOTAL BWR COSTS (INSIDE COMPACT)							339,583,627

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-37 PWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2010 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	386,384	508,060	340,480	277,400	0	1,512,324
VESSEL HEAD & BOTTOM	406,720	534,800	358,400	680	0	1,300,600
UPPER CORE SUPPORT ASSM	40,672	53,480	35,840	19,400	0	149,392
UPPER SUPPORT COLUMN	40,672	53,480	35,840	19,400	0	149,392
UPPER CORE BARREL	20,336	26,740	17,920	14,600	0	79,596
UPPER CORE GRID PLATE	50,840	66,850	44,800	36,500	0	198,990
GUIDE TUBES	61,008	80,220	53,760	29,100	0	224,088
LOWER CORE BARREL ^(a)	325,376	427,840	286,720	233,600	0	1,273,536
THERMAL SHIELDS ^(a)	61,008	80,220	53,760	43,800	0	238,788
CORE SHROUD ^(a)	40,672	53,480	35,840	29,200	0	159,192
LOWER GRID PLATE ^(a)	50,840	66,850	44,800	36,500	0	198,990
LOWER SUPPORT COLUMN	10,168	13,370	8,960	7,300	0	39,798
LOWER CORE FORGING	111,848	147,070	98,560	7,248	0	364,726
MISC. INTERNALS	81,344	106,960	71,680	0	0	259,984
BIO SHIELD CONCRETE	0	0	0	0	3,981,120	3,981,120
REACTOR CAVITY LINER	52,060	13,370	35,840	0	0	101,270
REACTOR COOLANT PUMPS	0	0	0	0	1,386,000	1,386,000
PRESSURIZER	0	0	0	0	1,188,000	1,188,000
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	63,800	63,800
PRESSURIZER RELIEF TANK	0	0	0	0	191,400	191,400
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	638,000	638,000
STEAM GENERATORS	0	0	0	0	7,049,460	7,049,460
REACTOR COOLANT PIPING	0	0	0	0	526,350	526,350
REMAINING CONTAM. MATLS	0	0	0	0	8,390,976	8,390,976
CONTAM. MATL OTHER BLDG	0	0	0	0	76,099,205	76,099,205
FILTER CARTRIDGES	0	0	0	0	138,600	138,600
SPENT RESINS	203,360	267,400	179,200	0	0	649,960
COMBUSTIBLE WASTES	0	0	0	0	5,568,750	5,568,750
EVAPORATOR BOTTOMS	955,792	1,256,780	842,240	0	0	3,054,812
POST-TMI-2 ADDITIONS	1,582,446	0	0	0	0	1,582,446
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES						387,039
SUBTOTAL PWR COSTS	4,481,546	3,756,970	2,544,640	754,728	105,221,661	117,146,584
TAXES & FEES (% OF CHARGES)						512,772
TAXES & FEES (\$/UNIT VOL.)						725,794
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						118,512,349

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-38 BWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2010 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	35,908	187,180	250,880	754,728	0	1,228,696
FUEL SUPPORT & PIECES	17,954	93,590	125,440	0	0	236,984
CONTROL RODS/INCORES	53,862	106,960	71,680	0	0	232,502
CONTROL RODS GUIDES	14,363	80,220	107,520	0	0	202,103
JET PUMPS	50,271	267,400	358,400	0	0	676,071
TOP FUEL GUIDES	86,179	962,640	645,120	0	0	1,693,939
CORE SUPPORT PLATE	39,499	213,920	277,760	0	0	531,179
CORE SHROUD ^(a)	168,767	1,871,800	1,254,400	0	0	3,294,967
REACTOR VESSEL WALL	28,726	267,400	197,120	0	0	493,246
SAC SHIELD NEUTRON ACTIV. MATL.	0	0	0	0	506,941	506,941
REACTOR WATER REC	0	0	0	0	495,676	495,676
SAC SHIELD CONTAMINATED MTL.	0	0	0	0	1,746,130	1,746,130
OTHER PRIMARY CONTAINMENT	0	0	0	0	19,917,152	19,917,152
CONTAINMENT ATMOSPHERIC	0	0	0	0	270,369	270,369
HIGH PRESSURE CORE SPRAY	0	0	0	0	95,756	95,756
LOW PRESSURE CORE SPRAY	0	0	0	0	56,327	56,327
REACTOR BLDG CLOSED COOLING	0	0	0	0	180,246	180,246
REACTOR CORE ISO COOLING	0	0	0	0	73,225	73,225
RESIDUAL HEAT REMOVAL	0	0	0	0	349,226	349,226
POOL LINER & RACKS	0	0	0	0	2,146,051	2,146,051
CONTAMINATED CONCRETE	0	0	0	0	2,444,583	2,444,583
OTHER REACTOR BUILDING	0	0	0	0	7,992,771	7,992,771
TURBINE	0	0	0	0	16,385,268	16,385,268
NUCLEAR STEAM CONDENSATE	0	0	0	0	2,044,662	2,044,662
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	4,151,284	4,151,284
MAIN STEAM	0	0	0	0	399,920	399,920
MOISTURE SEPARATOR REHEATERS	0	0	0	0	4,027,365	4,027,365
REACTOR FEEDWATER PUMPS	0	0	0	0	2,260,841	2,260,841
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	681,554	681,554
OTHER TG BLDG	0	0	0	0	27,357,920	27,357,920
RAD WASTE BLDG	0	0	0	0	13,546,592	13,546,592
REACTOR BLDG	0	0	0	0	1,689,804	1,689,804
TG BLDG	0	0	0	0	1,143,434	1,143,434
RAD WASTE & CONTROL	0	0	0	0	985,719	985,719
CONCENTRATOR BOTTOMS	2,298,105	3,008,250	2,016,000	0	0	7,322,355
OTHER	624,797	815,570	546,560	0	0	1,986,927
POST-TMI-2 ADDITIONS	129,337	0	0	0	0	129,337
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES						387,039
SUBTOTAL BWR COSTS	3,547,768	7,874,930	5,850,880	754,728	110,948,815	129,364,160
TAXES & FEES (% OF CHARGES)						791,860
TAXES & FEES (\$/UNIT VOL.)						601,878
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL BWR COSTS						130,885,098

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-39 PWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2010 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
VESSEL WALL	3,986,350	2,894,422	7,626,676	0	1,913,448	0	16,420,895
VESSEL HEAD & BOTTOM	2,540,054	3,046,760	10,040	0	0	0	5,596,854
UPPER CORE SUPPORT ASSM	239,799	304,676	5,020	0	76,736	0	626,230
UPPER SUPPORT COLUMN	221,701	304,676	50,200	0	70,944	0	647,521
UPPER CORE BARREL	105,570	152,338	401,404	0	50,674	0	709,986
UPPER CORE GRID PLATE	263,925	380,845	1,003,510	0	126,684	0	1,774,964
GUIDE TUBES	390,609	457,014	50,200	0	105,464	0	1,003,287
LOWER CORE BARREL ^(a)	1,689,120	2,437,408	6,422,464	0	810,778	0	11,359,770
THERMAL SHIELDS ^(a)	316,710	457,014	1,204,212	0	152,021	0	2,129,957
CORE SHROUD ^(a)	245,228	304,676	12,242,822	0	117,709	0	12,910,435
LOWER GRID PLATE ^(a)	263,925	380,845	2,007,020	0	126,684	0	2,778,474
LOWER SUPPORT COLUMN	66,963	76,169	200,702	0	32,142	0	375,976
LOWER CORE FORGING	727,540	837,859	1,255,000	0	349,219	0	3,169,618
MISC. INTERNALS	589,840	609,352	1,004,000	0	283,123	0	2,486,315
BIO SHIELD CONCRETE	0	0	0	0	0	3,981,120	3,981,120
REACTOR CAVITY LINER	289,568	0	5,020	0	0	0	294,588
REACTOR COOLANT PUMPS	0	0	0	0	0	1,386,000	1,386,000
PRESSURIZER	0	0	0	0	0	1,188,000	1,188,000
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	0	63,800	63,800
PRESSURIZER RELIEF TANK	0	0	0	0	0	191,400	191,400
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	0	638,000	638,000
STEAM GENERATORS	0	0	0	0	0	7,049,460	7,049,460
REACTOR COOLANT PIPING	0	0	0	0	0	526,350	526,350
REMAINING CONTAM. MATLS	0	0	0	0	0	8,390,976	8,390,976
CONTAM. MATL OTHER BLDG	0	0	0	0	0	76,099,205	76,099,205
FILTER CARTRIDGES	0	0	0	0	0	138,600	138,600
SPENT RESINS	1,327,140	1,523,380	4,014,040	0	637,027	0	7,501,587
COMBUSTIBLE WASTES	0	0	0	0	0	5,568,750	5,568,750
EVAPORATOR BOTTOMS	6,237,558	7,159,886	18,865,988	0	852,024	0	33,115,456
POST-TMI-2 ADDITIONS	12,516,387	0	0	0	0	0	12,516,387
SUBTOTAL PWR COSTS	32,017,985	21,327,320	56,368,318	0	5,704,677	105,221,661	220,639,960
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE							264,450
TOTAL PWR COSTS (INSIDE COMPACT)							220,904,410

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-40 BWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2010 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	LINER DOSE RATE	DOSE RATE SURCHARGE	VENDOR CHARGES	DISPOSAL COST
STEAM SEPARATOR	245,672	2,132,732	2,809,828	0	117,923	0	5,306,155
FUEL SUPPORT & PIECES	108,127	1,066,366	351,400	0	51,901	0	1,577,794
CONTROL RODS/INCORES	322,005	609,352	1,605,616	0	154,563	0	2,691,536
CONTROL RODS GUIDES	90,511	914,028	50,200	0	33,489	0	1,088,228
JET PUMPS	260,971	3,046,760	4,014,040	0	125,266	0	7,447,038
TOP FUEL GUIDES	447,379	5,484,168	14,450,544	0	214,742	0	20,596,834
CORE SUPPORT PLATE	300,712	2,361,239	326,300	0	111,263	0	3,099,514
CORE SHROUD ^(a)	876,118	10,663,660	28,098,280	0	420,537	0	40,058,595
REACTOR VESSEL WALL	190,716	1,675,718	1,084,320	0	70,565	0	3,021,319
SAC SHIELD NEUTRON-ACTIV. MATL	0	0	0	0	0	506,941	506,941
REACT. WATER REC	0	0	0	0	0	495,676	495,676
SAC SHIELD-CONTAMINATED MATL	0	0	0	0	0	1,746,130	1,746,130
OTHER PRIMARY CONTAINMENT	0	0	0	0	0	19,917,152	19,917,152
CONTAINM. ATMOSPHERIC	0	0	0	0	0	270,369	270,369
HIGH PRESSURE CORE SPRAY	0	0	0	0	0	95,756	95,756
LOW PRESSURE CORE SPRAY	0	0	0	0	0	56,327	56,327
REACTOR BLDG CLOSED COOLING	0	0	0	0	0	180,246	180,246
REACTOR CORE ISO COOLING	0	0	0	0	0	73,225	73,225
RESIDUAL HEAT REMOVAL	0	0	0	0	0	349,226	349,226
POOL LINER & RACKS	0	0	0	0	0	2,146,051	2,146,051
CONTAMINATED CONCRETE	0	0	0	0	0	2,444,583	2,444,583
OTHER REACTOR BUILDING	0	0	0	0	0	7,992,771	7,992,771
TURBINE	0	0	0	0	0	16,385,268	16,385,268
NUCLEAR STEAM CONDENSATE	0	0	0	0	0	2,044,662	2,044,662
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	0	4,151,284	4,151,284
MAIN STEAM	0	0	0	0	0	399,920	399,920
MOISTURE SEPARATOR REHEATERS	0	0	0	0	0	4,027,365	4,027,365
REACTOR FEEDWATER PUMPS	0	0	0	0	0	2,260,841	2,260,841
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	0	681,554	681,554
OTHER TG BLDG	0	0	0	0	0	27,357,920	27,357,920
RAD WASTE BLDG	0	0	0	0	0	13,546,592	13,546,592
REACTOR BLDG	0	0	0	0	0	1,689,804	1,689,804
TG BLDG	0	0	0	0	0	1,143,434	1,143,434
RAD WASTE & CONTROL	0	0	0	0	0	985,719	985,719
CONCENTRATOR BOTTOMS	25,631,595	17,138,025	45,157,950	0	3,472,227	0	91,399,797
OTHER	6,949,010	4,646,309	481,418	0	173,156	0	12,249,893
POST-TMI-2 ADDITIONS	1,022,993	0	0	0	0	0	1,022,993
SUBTOTAL BWR COSTS	36,445,811	49,738,357	98,429,896	0	4,945,631	110,948,815	300,508,509
ATLANTIC COMPACT COMMISSION ADMINISTRATIVE SURCHARGE							209,349
TOTAL BWR COSTS (INSIDE COMPACT)							300,717,858

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-41 PWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2008 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	375,060	560,120	269,040	2,869,000	0	4,073,220
VESSEL HEAD & BOTTOM	394,800	589,600	283,200	7,080	0	1,274,680
UPPER CORE SUPPORT ASSM	39,480	58,960	28,320	201,600	0	328,360
UPPER SUPPORT COLUMN	39,480	58,960	28,320	201,600	0	328,360
UPPER CORE BARREL	19,740	29,480	14,160	151,000	0	214,380
UPPER CORE GRID PLATE	49,350	73,700	35,400	377,500	0	535,950
GUIDE TUBES	59,220	88,440	42,480	302,400	0	492,540
LOWER CORE BARREL ^(a)	315,840	471,680	226,560	2,416,000	0	3,430,080
THERMAL SHIELDS ^(a)	59,220	88,440	42,480	453,000	0	643,140
CORE SHROUD ^(a)	39,480	58,960	28,320	302,000	0	428,760
LOWER GRID PLATE ^(a)	49,350	73,700	35,400	377,500	0	535,950
LOWER SUPPORT COLUMN	9,870	14,740	7,080	75,500	0	107,190
LOWER CORE FORGING	108,570	162,140	77,880	830,500	0	1,179,090
MISC. INTERNALS	78,960	117,920	56,640	604,000	0	857,520
BIO SHIELD CONCRETE	0	0	0	0	3,193,693	3,193,693
REACTOR CAVITY LINER	50,534	14,740	28,320	708	0	94,302
REACTOR COOLANT PUMPS	0	0	0	0	1,231,619	1,231,619
PRESSURIZER	0	0	0	0	319,369	319,369
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	19,326	19,326
PRESSURIZER RELIEF TANK	0	0	0	0	44,548	44,548
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	501,164	501,164
STEAM GENERATORS	0	0	0	0	4,507,202	4,507,202
REACTOR COOLANT PIPING	0	0	0	0	363,586	363,586
REMAINING CONTAM. MATLS	0	0	0	0	6,427,512	6,427,512
CONTAMINATED MATRL OTHR BLD	0	0	0	0	49,447,064	49,447,064
FILTER CARTRIDGES	0	0	0	0	88,441	88,441
SPENT RESINS	197,400	294,800	141,600	1,510,000	0	2,143,800
COMBUSTIBLE WASTES	0	0	0	0	884,407	884,407
EVAPORATOR BOTTOMS	927,780	1,385,560	665,520	2,231,879	0	5,210,739
POST-TMI-2 ADDITIONS	1,536,068	0	0	0	0	1,536,068
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES, (3 YRS)						374,400
SUBTOTAL PWR COSTS	4,350,203	4,141,940	2,010,720	12,911,267	67,027,931	90,816,460
TAXES & FEES (% OF CHARGES)						1,022,907
TAXES & FEES (\$/UNIT VOL)						725,794
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						92,692,361

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-42 BWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2008 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	34,841	206,360	198,240	35,504,000	0	35,943,441
FUEL SUPPORT & PIECES	17,470	103,180	99,120	1,057,000	0	1,276,770
CONTROL RODS/INCORES	52,311	117,920	56,640	10,144,000	0	10,370,871
CONTROL RODS GUIDES	13,917	88,440	84,960	906,000	0	1,093,317
JET PUMPS	48,857	294,800	283,200	50,720,000	0	51,346,857
TOP FUEL GUIDES	83,698	1,061,280	509,760	91,296,000	0	92,950,738
CORE SUPPORT PLATE	38,394	235,840	219,480	2,340,500	0	2,834,214
CORE SHROUD ^(a)	163,842	2,063,600	991,200	177,520,000	0	180,738,642
REACTOR VESSEL WALL	27,932	294,800	155,760	1,661,000	0	2,139,492
SAC SHIELD	0	0	0	0	1,632,589	1,632,589
REACTOR WATER REC	0	0	0	0	523,267	523,267
SAC SHIELD	0	0	0	0	4,227,912	4,227,912
OTHER PRIMARY CONTAINMENT	0	0	0	0	16,944,058	16,944,058
CONTAINMENT ATMOSPHERIC	0	0	0	0	68,206	68,206
HIGH PRESSURE CORE SPRAY	0	0	0	0	166,423	166,423
LOW PRESSURE CORE SPRAY	0	0	0	0	60,021	60,021
REACTOR BLDG CLOSED COOLING	0	0	0	0	163,258	163,258
REACTOR CORE ISO COOLING	0	0	0	0	52,999	52,999
RESIDUAL HEAT REMOVAL	0	0	0	0	502,003	502,003
POOL LINER & RACKS	0	0	0	0	2,080,944	2,080,944
CONTAMINATED CONCRETE	0	0	0	0	2,975,264	2,975,264
OTHER REACTOR BUILDING	0	0	0	0	3,708,077	3,708,077
TURBINE	0	0	0	0	9,980,248	9,980,248
NUCLEAR STEAM CONDENSATE	0	0	0	0	1,319,092	1,319,092
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	4,429,584	4,429,584
MAIN STEAM	0	0	0	0	193,708	193,708
MOISTURE SEPARATOR REHEATERS	0	0	0	0	2,504,756	2,504,756
REACTOR FEEDWATER PUMPS	0	0	0	0	658,856	658,856
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	882,075	882,075
OTHER TG BLDG	0	0	0	0	19,145,326	19,145,326
RAD WASTE BLDG	0	0	0	0	6,539,338	6,539,338
REACTOR BLDG	0	0	0	0	4,664,920	4,664,920
TG BLDG	0	0	0	0	3,069,026	3,069,026
RAD WASTE & CONTROL	0	0	0	0	2,823,504	2,823,504
CONCENTRATOR BOTTOMS	2,220,750	3,316,500	1,593,000	5,296,145	0	12,426,395
OTHER	602,070	899,140	431,880	246,454	0	2,179,544
POST-TMI-2 ADDITIONS	125,546	0	0	0	0	125,546
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES, (3.5 YRS)						499,200
SUBTOTAL BWR COSTS	3,429,628	8,681,860	4,623,240	376,691,099	89,315,455	483,240,482
TAXES & FEES (% OF CHARGES)						16,938,776
TAXES & FEES (\$/UNIT VOL.)						599,403
ANNUAL PERMIT FEES (3.5 YRS)						169,600
TOTAL BWR COSTS						500,948,261

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-43 PWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2008 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	DOSE RATE SURCHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	3,682,407	2,673,832	7,052,800	1,767,555	0	15,176,594
VESSEL HEAD & BOTTOM	2,346,371	2,814,560	9,280	0	0	5,170,211
UPPER CORE SUPPORT ASSM	221,514	281,456	4,640	70,884	0	578,494
UPPER SUPPORT COLUMN	204,796	281,456	46,400	65,535	0	598,186
UPPER CORE BARREL	97,524	140,728	371,200	46,812	0	656,264
UPPER CORE GRID PLATE	243,810	351,820	928,000	117,029	0	1,640,659
GUIDE TUBES	360,839	422,184	46,400	97,426	0	926,849
LOWER CORE BARREL ^(a)	1,560,384	2,251,648	5,939,200	748,984	0	10,500,216
THERMAL SHIELDS ^(a)	292,572	422,184	1,113,600	140,435	0	1,968,791
CORE SHROUD ^(a)	226,529	281,456	11,321,600	108,734	0	11,938,319
LOWER GRID PLATE ^(a)	243,810	351,820	1,856,000	117,029	0	2,568,659
LOWER SUPPORT COLUMN	61,857	70,364	185,600	29,691	0	347,512
LOWER CORE FORGING	672,064	774,004	1,160,000	322,591	0	2,928,658
MISC. INTERNALS	544,880	562,912	928,000	261,542	0	2,297,334
BIO SHIELD CONCRETE	0	0	0	0	3,193,693	3,193,693
REACTOR CAVITY LINER	267,488	0	4,640	0	0	272,128
REACTOR COOLANT PUMPS	0	0	0	0	1,231,619	1,231,619
PRESSURIZER	0	0	0	0	319,369	319,369
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	19,326	19,326
PRESSURIZER RELIEF TANK	0	0	0	0	44,548	44,548
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	501,164	501,164
STEAM GENERATORS	0	0	0	0	4,507,202	4,507,202
REACTOR COOLANT PIPING	0	0	0	0	363,586	363,586
REMAINING CONTAM. MATLS	0	0	0	0	6,427,512	6,427,512
CONTAM. MATL OTHER BLDG	0	0	0	0	49,447,064	49,447,064
FILTER CARTRIDGES	0	0	0	0	88,441	88,441
SPENT RESINS	1,225,980	1,407,280	3,712,000	588,470	0	6,933,730
COMBUSTIBLE WASTES	0	0	0	0	884,407	884,407
EVAPORATOR BOTTOMS	5,762,106	6,614,216	17,446,400	787,079	0	30,609,801
POST-TMI-2 ADDITIONS	11,562,064	0	0	0	0	11,562,064
SITE ACCESS FEES (3 YRS)						0
SUBTOTAL PWR COSTS	29,576,993	19,701,920	52,125,760	5,269,796	67,027,931	173,702,400
BARNWELL COUNTY BUSINESS TAX						0
ATLANTIC COMPACT SURCHARGE (INSIDE COMPACT)						3,883,482
TOTAL PWR COSTS (INSIDE COMPACT)						177,585,882

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-44 BWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2008 dollars)

REFERENCE BWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	DOSE RATE SURCHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	226,342	1,970,192	2,598,400	108,644	0	4,903,579
FUEL SUPPORT & PIECES	99,706	985,096	324,800	47,859	0	1,457,461
CONTROL RODS/INCORES	296,851	562,912	1,484,800	142,488	0	2,487,051
CONTROL RODS GUIDES	83,437	844,368	46,400	30,872	0	1,005,077
JET PUMPS	241,372	2,814,560	3,712,000	115,859	0	6,883,790
TOP FUEL GUIDES	413,502	5,066,208	13,363,200	198,481	0	19,041,391
CORE SUPPORT PLATE	277,208	2,181,284	301,600	102,567	0	2,862,659
CORE SHROUD ^(a)	809,449	9,850,960	25,984,000	388,536	0	37,032,945
REACTOR VESSEL WALL	176,108	1,548,008	1,002,240	65,160	0	2,791,516
SAC SHIELD	0	0	0	0	1,632,589	1,632,589
REACTOR WATER REC	0	0	0	0	523,267	523,267
SAC SHIELD	0	0	0	0	4,227,912	4,227,912
OTHER PRIMARY CONTAINMENT	0	0	0	0	16,944,058	16,944,058
CONTAINMENT ATMOSPHERIC	0	0	0	0	68,206	68,206
HIGH PRESSURE CORE SPRAY	0	0	0	0	166,423	166,423
LOW PRESSURE CORE SPRAY	0	0	0	0	60,021	60,021
REACTOR BLDG CLOSED COOLING	0	0	0	0	163,258	163,258
REACTOR CORE ISO COOLING	0	0	0	0	52,999	52,999
RESIDUAL HEAT REMOVAL	0	0	0	0	502,003	502,003
POOL LINER & RACKS	0	0	0	0	2,080,944	2,080,944
CONTAMINATED CONCRETE	0	0	0	0	2,975,264	2,975,264
OTHER REACTOR BUILDING	0	0	0	0	3,708,077	3,708,077
TURBINE	0	0	0	0	9,980,248	9,980,248
NUCLEAR STEAM CONDENSATE	0	0	0	0	1,319,092	1,319,092
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	4,429,584	4,429,584
MAIN STEAM	0	0	0	0	193,708	193,708
MOISTURE SEPARATOR REHEATERS	0	0	0	0	2,504,756	2,504,756
REACTOR FEEDWATER PUMPS	0	0	0	0	658,856	658,856
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	882,075	882,075
OTHER TG BLDG	0	0	0	0	19,145,326	19,145,326
RAD WASTE BLDG	0	0	0	0	6,539,338	6,539,338
REACTOR BLDG	0	0	0	0	4,664,920	4,664,920
TG BLDG	0	0	0	0	3,069,026	3,069,026
RAD WASTE & CONTROL	0	0	0	0	2,823,504	2,823,504
CONCENTRATOR BOTTOMS	23,677,260	15,831,900	41,760,000	3,207,479	0	84,476,639
OTHER	6,419,168	4,292,204	444,976	159,953	0	11,316,301
POST-TMI-2 ADDITIONS	944,994	0	0	0	0	944,994
SITE ACCESS FEES (3.5 YRS)						0
SUBTOTAL BWR COSTS	33,665,397	45,947,692	91,022,416	4,567,898	89,315,455	264,518,858
BARNWELL COUNTY BUSINESS TAX						0
ATLANTIC COMPACT SURCHARGE (INSIDE COMPACT)						4,021,086
TOTAL BWR COSTS (INSIDE COMPACT)						268,539,944

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-45 PWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2006 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	330,220	460,180	230,280	1,014,600	0	2,035,280
VESSEL HEAD & BOTTOM	347,600	484,400	242,400	2,520	0	1,076,920
UPPER CORE SUPPORT ASSM	34,760	48,440	24,240	71,200	0	178,640
UPPER SUPPORT COLUMN	34,760	48,440	24,240	71,200	0	178,640
UPPER CORE BARREL	17,380	24,220	12,120	53,400	0	107,120
UPPER CORE GRID PLATE	43,450	60,550	30,300	133,500	0	267,800
GUIDE TUBES	52,140	72,660	36,360	106,800	0	267,960
LOWER CORE BARREL ^(a)	278,080	387,520	193,920	854,400	0	1,713,920
THERMAL SHIELDS ^(a)	52,140	72,660	36,360	160,200	0	321,360
CORE SHROUD ^(a)	34,760	48,440	24,240	106,800	0	214,240
LOWER GRID PLATE ^(a)	43,450	60,550	30,300	133,500	0	267,800
LOWER SUPPORT COLUMN	8,690	12,110	6,060	26,700	0	53,560
LOWER CORE FORGING	95,590	133,210	66,660	293,700	0	589,160
MISC. INTERNALS	69,520	96,880	48,480	213,600	0	428,480
BIO SHIELD CONCRETE	0	0	0	0	2,571,846	2,571,846
REACTOR CAVITY LINER	44,493	12,110	24,240	252	0	81,095
REACTOR COOLANT PUMPS	0	0	0	0	991,810	991,810
PRESSURIZER	0	0	0	0	257,185	257,185
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	15,563	15,563
PRESSURIZER RELIEF TANK	0	0	0	0	35,874	35,874
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	403,582	403,582
STEAM GENERATORS	0	0	0	0	3,629,601	3,629,601
REACTOR COOLANT PIPING	0	0	0	0	292,792	292,792
REMAINING CONTAM. MATLS	0	0	0	0	5,176,006	5,176,006
CONTAM. MATL OTHER BLDG	0	0	0	0	39,819,187	39,819,187
FILTER CARTRIDGES	0	0	0	0	71,220	71,220
SPENT RESINS	173,800	242,200	121,200	534,000	0	1,071,200
COMBUSTIBLE WASTES	0	0	0	0	712,204	712,204
EVAPORATOR BOTTOMS	816,860	1,138,340	569,640	790,701	0	3,315,541
POST-TMI-2 ADDITIONS	1,352,425	0	0	0	0	1,352,425
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES, (3 YRS)						401,727
SUBTOTAL PWR COSTS	3,830,118	3,402,910	1,721,040	4,567,073	53,976,869	67,899,737
TAXES & FEES (% OF CHARGES)						598,683
TAXES & FEES (\$/UNIT VOL)						725,794
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						69,351,414

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-46 BWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2006 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	CONTAINER RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	30,676	169,540	169,680	12,555,200	0	12,925,096
FUEL SUPPORT & PIECES	15,381	84,770	84,840	373,800	0	558,791
CONTROL RODS/INCORES	46,057	96,880	48,480	3,587,200	0	3,778,617
CONTROL RODS GUIDES	12,253	72,660	72,720	320,400	0	478,033
JET PUMPS	43,016	242,200	242,400	17,936,000	0	18,463,616
TOP FUEL GUIDES	73,691	871,920	436,320	32,284,800	0	33,666,731
CORE SUPPORT PLATE	33,804	193,760	187,860	827,700	0	1,243,124
CORE SHROUD ^(a)	144,254	1,695,400	848,400	62,776,000	0	65,464,054
REACTOR VESSEL WALL	24,593	242,200	133,320	587,400	0	987,513
SAC SHIELD	0	0	0	0	1,115,496	1,115,496
REACTOR WATER REC	0	0	0	0	357,532	357,532
SAC SHIELD	0	0	0	0	2,888,796	2,888,796
OTHER PRIMARY CONTAINMENT	0	0	0	0	11,577,329	11,577,329
CONTAINMENT ATMOSPHERIC	0	0	0	0	46,603	46,603
HIGH PRESSURE CORE SPRAY	0	0	0	0	113,712	113,712
LOW PRESSURE CORE SPRAY	0	0	0	0	41,011	41,011
REACTOR BLDG CLOSED COOLING	0	0	0	0	111,549	111,549
REACTOR CORE ISO COOLING	0	0	0	0	36,212	36,212
RESIDUAL HEAT REMOVAL	0	0	0	0	343,003	343,003
POOL LINER & RACKS	0	0	0	0	1,421,842	1,421,842
CONTAMINATED CONCRETE	0	0	0	0	2,032,902	2,032,902
OTHER REACTOR BUILDING	0	0	0	0	2,533,609	2,533,609
TURBINE	0	0	0	0	6,819,182	6,819,182
NUCLEAR STEAM CONDENSATE	0	0	0	0	901,293	901,293
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	3,026,592	3,026,592
MAIN STEAM	0	0	0	0	132,355	132,355
MOISTURE SEPARATOR REHEATERS	0	0	0	0	1,711,419	1,711,419
REACTOR FEEDWATER PUMPS	0	0	0	0	450,175	450,175
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	602,694	602,694
OTHER TG BLDG	0	0	0	0	13,081,385	13,081,385
RAD WASTE BLDG	0	0	0	0	4,468,119	4,468,119
REACTOR BLDG	0	0	0	0	3,187,390	3,187,390
TG BLDG	0	0	0	0	2,096,967	2,096,967
RAD WASTE & CONTROL	0	0	0	0	1,929,210	1,929,210
CONCENTRATOR BOTTOMS	1,955,250	2,724,750	1,363,500	1,876,335	0	7,919,835
OTHER	530,090	738,710	369,660	87,766	0	1,726,226
POST-TMI-2 ADDITIONS	110,537	0	0	0	0	110,537
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES (3.5 YRS)						535,636
SUBTOTAL BWR COSTS	3,019,601	7,132,790	3,957,180	133,212,601	61,026,373	208,884,182
TAXES & FEES (% OF CHARGES)						6,357,886
TAXES & FEES (\$/UNIT VOL.)						599,403
ANNUAL PERMIT FEES (3.5 YRS)						169,600
TOTAL BWR COSTS						216,011,070

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-47 PWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2006 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	CASK HANDLING	CURIE SURCHARGE	DOSE RATE SURCHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	3,344,560	2,428,580	6,399,200	1,605,389	0	13,777,729
VESSEL HEAD & BOTTOM	2,131,074	2,556,400	8,420	0	0	4,695,894
UPPER CORE SUPPORT ASSM	201,188	255,640	4,210	64,380	0	525,418
UPPER SUPPORT COLUMN	186,004	255,640	42,100	59,521	0	543,265
UPPER CORE BARREL	88,578	127,820	336,800	42,517	0	595,715
UPPER CORE GRID PLATE	221,445	319,550	842,000	106,294	0	1,489,289
GUIDE TUBES	327,739	383,460	42,100	88,489	0	841,788
LOWER CORE BARREL ^(a)	1,417,248	2,045,120	5,388,800	680,279	0	9,531,447
THERMAL SHIELDS ^(a)	265,734	383,460	1,010,400	127,552	0	1,787,146
CORE SHROUD ^(a)	205,743	255,640	10,272,400	98,757	0	10,832,540
LOWER GRID PLATE ^(a)	221,445	319,550	1,684,000	106,294	0	2,331,289
LOWER SUPPORT COLUMN	56,181	63,910	168,400	26,967	0	315,458
LOWER CORE FORGING	610,397	703,010	1,052,500	292,990	0	2,658,897
MISC. INTERNALS	494,880	511,280	842,000	237,542	0	2,085,702
BIO SHIELD CONCRETE	0	0	0	0	2,571,846	2,571,846
REACTOR CAVITY LINER	242,944	0	4,210	0	0	247,154
REACTOR COOLANT PUMPS	0	0	0	0	991,810	991,810
PRESSURIZER	0	0	0	0	257,185	257,185
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	15,563	15,563
PRESSURIZER RELIEF TANK	0	0	0	0	35,874	35,874
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	403,582	403,582
STEAM GENERATORS	0	0	0	0	3,629,601	3,629,601
REACTOR COOLANT PIPING	0	0	0	0	292,792	292,792
REMAINING CONTAM. MATLS	0	0	0	0	5,176,006	5,176,006
CONTAM. MATL OTHER BLDG	0	0	0	0	39,819,187	39,819,187
FILTER CARTRIDGES	0	0	0	0	71,220	71,220
SPENT RESINS	1,113,480	1,278,200	3,368,000	534,470	0	6,294,150
COMBUSTIBLE WASTES	0	0	0	0	712,204	712,204
EVAPORATOR BOTTOMS	5,233,356	6,007,540	15,829,600	714,854	0	27,785,350
POST-TMI-2 ADDITIONS	10,501,290	0	0	0	0	10,501,290
SITE ACCESS FEES (3 YRS)						0
SUBTOTAL PWR COSTS	26,863,286	17,894,800	47,295,140	4,786,297	53,976,869	150,816,392
BARNWELL COUNTY BUSINESS TAX						0
ATLANTIC COMPACT SURCHARGE (INSIDE COMPACT)						3,883,482
TOTAL PWR COSTS (INSIDE COMPACT)						154,699,874

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-48 BWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2006 dollars)

REFERENCE BWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	DOSE RATE SURCHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	205,580	1,789,480	2,357,600	98,678	0	4,451,338
FUEL SUPPORT & PIECES	90,557	894,740	294,700	43,468	0	1,323,465
CONTROL RODS/INCORES	269,611	511,280	1,347,200	129,413	0	2,257,504
CONTROL RODS GUIDES	75,783	766,920	42,100	28,040	0	912,843
JET PUMPS	219,231	2,556,400	3,368,000	105,231	0	6,248,861
TOP FUEL GUIDES	375,571	4,601,520	12,124,800	180,274	0	17,282,165
CORE SUPPORT PLATE	251,770	1,981,210	273,650	93,155	0	2,599,785
CORE SHROUD ^(a)	735,197	8,947,400	23,576,000	352,895	0	33,611,492
REACTOR VESSEL WALL	159,949	1,406,020	909,360	59,181	0	2,534,509
SAC SHIELD	0	0	0	0	1,115,496	1,115,496
REACTOR WATER REC	0	0	0	0	357,532	357,532
SAC SHIELD	0	0	0	0	2,888,796	2,888,796
OTHER PRIMARY CONTAINMENT	0	0	0	0	11,577,329	11,577,329
CONTAINMENT ATMOSPHERIC	0	0	0	0	46,603	46,603
HIGH PRESSURE CORE SPRAY	0	0	0	0	113,712	113,712
LOW PRESSURE CORE SPRAY	0	0	0	0	41,011	41,011
REACTOR BLDG CLOSED COOLING	0	0	0	0	111,549	111,549
REACTOR CORE ISO COOLING	0	0	0	0	36,212	36,212
RESIDUAL HEAT REMOVAL	0	0	0	0	343,003	343,003
POOL LINER & RACKS	0	0	0	0	1,421,842	1,421,842
CONTAMINATED CONCRETE	0	0	0	0	2,032,902	2,032,902
OTHER REACTOR BUILDING	0	0	0	0	2,533,609	2,533,609
TURBINE	0	0	0	0	6,819,182	6,819,182
NUCLEAR STEAM CONDENSATE	0	0	0	0	901,293	901,293
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	3,026,592	3,026,592
MAIN STEAM	0	0	0	0	132,355	132,355
MOISTURE SEPARATOR REHEATERS	0	0	0	0	1,711,419	1,711,419
REACTOR FEEDWATER PUMPS	0	0	0	0	450,175	450,175
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	602,694	602,694
OTHER TG BLDG	0	0	0	0	13,081,385	13,081,385
RAD WASTE BLDG	0	0	0	0	4,468,119	4,468,119
REACTOR BLDG	0	0	0	0	3,187,390	3,187,390
TG BLDG	0	0	0	0	2,096,967	2,096,967
RAD WASTE & CONTROL	0	0	0	0	1,929,210	1,929,210
CONCENTRATOR BOTTOMS	21,504,964	14,379,750	37,890,000	2,913,206	0	76,687,920
OTHER	5,830,235	3,898,510	403,739	145,278	0	10,277,762
POST-TMI-2 ADDITIONS	858,295	0	0	0	0	858,295
SITE ACCESS FEES (3.5 YRS)						0
SUBTOTAL BWR COSTS	30,576,742	41,733,230	82,587,149	4,148,818	61,026,373	220,072,312
BARNWELL COUNTY BUSINESS TAX						0
ATLANTIC COMPACT SURCHARGE (INSIDE COMPACT)						4,021,086
TOTAL BWR COSTS (INSIDE COMPACT)						224,093,398

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-49 PWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2004 dollars)

REFERENCE PWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	LINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	215,080	373,160	187,340	1,520,000	0	2,295,580
VESSEL HEAD & BOTTOM	226,400	392,800	197,200	3,800	0	820,200
UPPER CORE SUPPORT ASSM	22,640	39,280	19,720	107,200	0	188,840
UPPER SUPPORT COLUMN	22,640	39,280	19,720	107,200	0	188,840
UPPER CORE BARREL	11,320	19,640	9,860	80,000	0	120,820
UPPER CORE GRID PLATE	28,300	49,100	24,650	200,000	0	302,050
GUIDE TUBES	33,960	58,920	29,580	160,800	0	283,260
LOWER CORE BARREL ^(a)	181,120	314,240	157,760	1,280,000	0	1,933,120
THERMAL SHIELDS ^(a)	33,960	58,920	29,580	240,000	0	362,460
CORE SHROUD ^(a)	22,640	39,280	19,720	160,000	0	241,640
LOWER GRID PLATE ^(a)	28,300	49,100	24,650	200,000	0	302,050
LOWER SUPPORT COLUMN	5,660	9,820	4,930	40,000	0	60,410
LOWER CORE FORGING	62,260	108,020	54,230	440,000	0	664,510
MISC. INTERNALS	45,280	78,560	39,440	320,000	0	483,280
BIO SHIELD CONCRETE	0	0	0	0	2,571,846	2,571,846
REACTOR CAVITY LINER	28,979	9,820	19,720	0	0	58,519
REACTOR COOLANT PUMPS	0	0	0	0	991,810	991,810
PRESSURIZER	0	0	0	0	257,185	257,185
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	15,563	15,563
PRESSURIZER RELIEF TANK	0	0	0	0	35,874	35,874
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	403,582	403,582
STEAM GENERATORS	0	0	0	0	3,629,601	3,629,601
REACTOR COOLANT PIPING	0	0	0	0	292,792	292,792
REMAINING CONTAM. MATLS	0	0	0	0	5,176,006	5,176,006
CONTAM. MATL OTHER BLDG	0	0	0	0	39,819,187	39,819,187
FILTER CARTRIDGES	0	0	0	0	71,220	71,220
SPENT RESINS	113,200	196,400	98,600	800,000	0	1,208,200
COMBUSTIBLE WASTES	0	0	0	0	712,204	712,204
EVAPORATOR BOTTOMS	532,040	923,080	463,420	1,186,315	0	3,104,855
POST-TMI-2 ADDITIONS	880,866	0	0	0	0	880,866
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES (3 YRS)						382,821
SUBTOTAL PWR COSTS	2,494,645	2,759,420	1,400,120	6,845,315	53,976,869	67,859,190
TAXES & FEES (% OF CHARGES)						596,940
TAXES & FEES (\$/CU.FT.)						599,569
ANNUAL PERMIT FEES (3 YRS)						127,200
TOTAL PWR COSTS						69,182,899

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-50 BWR Disposition Costs Using Waste Vendors with Burial Costs at the Washington Site (2004 dollars)

REFERENCE BWR COMPONENT	VOLUME CHARGE	SHIPMENT CHARGE	CONTAINER CHARGE	LINER DOSE RATE CHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	19,980	137,480	138,040	18,816,000	0	19,111,500
FUEL SUPPORT & PIECES	10,018	68,740	69,020	560,000	0	707,778
CONTROL RODS/INCORES	29,998	78,560	39,440	5,376,000	0	5,523,998
CONTROL RODS GUIDES	7,981	58,920	59,160	480,000	0	606,061
JET PUMPS	28,017	196,400	197,200	26,880,000	0	27,301,617
TOP FUEL GUIDES	47,997	707,040	354,960	48,384,000	0	49,493,997
CORE SUPPORT PLATE	22,017	157,120	152,830	1,240,000	0	1,571,967
CORE SHROUD ^(a)	93,956	1,374,800	690,200	94,080,000	0	96,238,956
REACTOR VESSEL WALL	16,018	196,400	108,460	880,000	0	1,200,878
SAC SHIELD (NEUTRON ACTIV. MATL)	0	0	0	0	1,115,496	1,115,496
REACTOR WATER REC	0	0	0	0	357,532	357,532
SAC SHIELD (CONTAM. MATL)	0	0	0	0	2,888,796	2,888,796
OTHER PRIMARY CONTAINMENT	0	0	0	0	11,577,329	11,577,329
CONTAINMENT ATMOSPHERIC	0	0	0	0	46,603	46,603
HIGH PRESSURE CORE SPRAY	0	0	0	0	113,712	113,712
LOW PRESSURE CORE SPRAY	0	0	0	0	41,011	41,011
REACTOR BLDG CLOSED COOLING	0	0	0	0	111,549	111,549
REACTOR CORE ISO COOLING	0	0	0	0	36,212	36,212
RESIDUAL HEAT REMOVAL	0	0	0	0	343,003	343,003
POOL LINER & RACKS	0	0	0	0	1,421,842	1,421,842
CONTAMINATED CONCRETE	0	0	0	0	2,032,902	2,032,902
OTHER REACTOR BUILDING	0	0	0	0	2,533,609	2,533,609
TURBINE	0	0	0	0	6,819,182	6,819,182
NUCLEAR STEAM CONDENSATE	0	0	0	0	901,293	901,293
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	3,026,592	3,026,592
MAIN STEAM	0	0	0	0	132,355	132,355
MOISTURE SEPARATOR REHEATERS	0	0	0	0	1,711,419	1,711,419
REACTOR FEEDWATER PUMPS	0	0	0	0	450,175	450,175
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	602,694	602,694
OTHER TG BLDG	0	0	0	0	13,081,385	13,081,385
RAD WASTE BLDG	0	0	0	0	4,468,119	4,468,119
REACTOR BLDG	0	0	0	0	3,187,390	3,187,390
TG BLDG	0	0	0	0	2,096,967	2,096,967
RAD WASTE & CONTROL	0	0	0	0	1,929,210	1,929,210
CONCENTRATOR BOTTOMS	1,273,500	2,209,500	1,109,250	2,815,175	0	7,407,425
OTHER	345,260	599,020	300,730	132,240	0	1,377,250
POST-TMI-2 ADDITIONS	71,995	0	0	0	0	71,995
HEAVY OBJECT SURCHARGE						0
SITE AVAILABILITY CHARGES (3.5 YRS)						510,428
SUBTOTAL BWR COSTS	1,966,737	5,783,980	3,219,290	199,643,415	61,026,373	272,150,223
TAXES & FEES (% OF CHARGES)						9,078,326
TAXES & FEES (\$/CU.FT.)						495,159
ANNUAL PERMIT FEES (3.5 YRS)						169,600
TOTAL BWR COSTS						281,893,308

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-51 PWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2004 dollars)

REFERENCE PWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	DOSE RATE SURCHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
VESSEL WALL	2,838,980	2,061,272	5,441,752	1,362,711	0	11,704,715
VESSEL HEAD & BOTTOM	1,808,550	2,169,760	7,160	0	0	3,985,470
UPPER CORE SUPPORT ASSM	170,740	216,976	3,580	54,637	0	445,932
UPPER SUPPORT COLUMN	157,854	216,976	35,800	50,513	0	461,143
UPPER CORE BARREL	75,177	108,488	286,408	36,085	0	506,158
UPPER CORE GRID PLATE	187,943	271,220	716,020	90,212	0	1,265,395
GUIDE TUBES	278,155	325,464	35,800	75,102	0	714,521
LOWER CORE BARREL ^(a)	1,202,832	1,735,808	4,582,528	577,359	0	8,098,527
THERMAL SHIELDS ^(a)	225,531	325,464	859,224	108,255	0	1,518,474
CORE SHROUD ^(a)	174,605	216,976	8,735,444	83,811	0	9,210,836
LOWER GRID PLATE ^(a)	187,943	271,220	1,432,040	90,212	0	1,981,415
LOWER SUPPORT COLUMN	47,678	54,244	143,204	22,886	0	268,012
LOWER CORE FORGING	518,017	596,684	895,000	248,648	0	2,258,349
MISC. INTERNALS	420,000	433,952	716,000	201,600	0	1,771,552
BIO SHIELD CONCRETE	0	0	0	0	2,571,846	2,571,846
REACTOR CAVITY LINER	206,176	0	3,580	0	0	209,756
REACTOR COOLANT PUMPS	0	0	0	0	991,810	991,810
PRESSURIZER	0	0	0	0	257,185	257,185
R.Hx, EHx, SUMP PUMP, CAVITY PUMP	0	0	0	0	15,563	15,563
PRESSURIZER RELIEF TANK	0	0	0	0	35,874	35,874
SAFETY INJECTION ACCUM. TANKS	0	0	0	0	403,582	403,582
STEAM GENERATORS	0	0	0	0	3,629,601	3,629,601
REACTOR COOLANT PIPING	0	0	0	0	292,792	292,792
REMAINING CONTAM. MATLS	0	0	0	0	5,176,006	5,176,006
CONTAM. MATL OTHER BLDG	0	0	0	0	39,819,187	39,819,187
FILTER CARTRIDGES	0	0	0	0	71,220	71,220
SPENT RESINS	945,000	1,084,880	2,864,080	453,600	0	5,347,560
COMBUSTIBLE WASTES	0	0	0	0	712,204	712,204
EVAPORATOR BOTTOMS	4,441,500	5,098,936	13,461,176	606,690	0	23,608,302
POST-TMI-2 ADDITIONS	8,913,864	0	0	0	0	8,913,864
SITE ACCESS FEES (3 YRS)						0
SUBTOTAL PWR COSTS	22,800,544	15,188,320	40,218,796	4,062,321	53,976,869	136,246,850
BARNWELL COUNTY BUSINESS TAX						0
ATLANTIC COMPACT SURCHARGE (INSIDE COMPACT)						3,883,482
TOTAL PWR COSTS (INSIDE COMPACT)						140,130,332

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-52 BWR Disposition Costs Using Waste Vendors with Burial Costs at the South Carolina Site (2004 dollars)

REFERENCE BWR COMPONENT	BASE CHARGE	CASK HANDLING	CURIE SURCHARGE	DOSE RATE SURCHARGE	WASTE VENDOR CHARGE	DISPOSAL COST
STEAM SEPARATOR	174,477	1,518,832	2,004,856	83,749	0	3,781,915
FUEL SUPPORT & PIECES	76,852	759,416	250,600	36,889	0	1,123,757
CONTROL RODS/INCORES	228,816	433,952	1,145,632	109,832	0	1,918,232
CONTROL RODS GUIDES	64,318	650,928	35,800	23,798	0	774,844
JET PUMPS	186,063	2,169,760	2,864,080	89,310	0	5,309,213
TOP FUEL GUIDES	318,750	3,905,568	10,310,688	153,000	0	14,688,007
CORE SUPPORT PLATE	213,675	1,681,564	232,700	79,060	0	2,206,999
CORE SHROUD ^(a)	623,969	7,594,160	20,048,560	299,505	0	28,566,194
REACTOR VESSEL WALL	135,741	1,193,368	773,280	50,224	0	2,152,614
SAC SHIELD (NEUTRON ACT. MATL)	0	0	0	0	1,115,496	1,115,496
REACTOR WATER REC	0	0	0	0	357,532	357,532
SAC SHIELD (CONTAM. MATL)	0	0	0	0	2,888,796	2,888,796
OTHER PRIMARY CONTAINMENT	0	0	0	0	11,577,329	11,577,329
CONTAINMENT ATMOSPHERIC	0	0	0	0	46,603	46,603
HIGH PRESSURE CORE SPRAY	0	0	0	0	113,712	113,712
LOW PRESSURE CORE SPRAY	0	0	0	0	41,011	41,011
REACTOR BLDG CLOSED COOLING	0	0	0	0	111,549	111,549
REACTOR CORE ISO COOLING	0	0	0	0	36,212	36,212
RESIDUAL HEAT REMOVAL	0	0	0	0	343,003	343,003
POOL LINER & RACKS	0	0	0	0	1,421,842	1,421,842
CONTAMINATED CONCRETE	0	0	0	0	2,032,902	2,032,902
OTHER REACTOR BUILDING	0	0	0	0	2,533,609	2,533,609
TURBINE	0	0	0	0	6,819,182	6,819,182
NUCLEAR STEAM CONDENSATE	0	0	0	0	901,293	901,293
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	3,026,592	3,026,592
MAIN STEAM	0	0	0	0	132,355	132,355
MOISTURE SEPARATOR REHEATERS	0	0	0	0	1,711,419	1,711,419
REACTOR FEEDWATER PUMPS	0	0	0	0	450,175	450,175
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	602,694	602,694
OTHER TG BLDG	0	0	0	0	13,081,385	13,081,385
RAD WASTE BLDG	0	0	0	0	4,468,119	4,468,119
REACTOR BLDG	0	0	0	0	3,187,390	3,187,390
TG BLDG	0	0	0	0	2,096,967	2,096,967
RAD WASTE & CONTROL	0	0	0	0	1,929,210	1,929,210
CONCENTRATOR BOTTOMS	18,254,169	12,204,900	32,220,900	2,472,831	0	65,152,801
OTHER	4,948,908	3,308,884	343,322	123,317	0	8,724,431
POST-TMI-2 ADDITIONS	728,551	0	0	0	0	728,551
SITE ACCESS FEES (3.5 YRS)						0
SUBTOTAL BWR COSTS	25,954,291	35,421,332	70,230,418	3,521,516	61,026,373	196,153,930
BARNWELL COUNTY BUSINESS TAX						0
ATLANTIC COMPACT SURCHARGE (INSIDE COMPACT)						4,021,086
TOTAL BWR COSTS (INSIDE COMPACT)						200,175,016

^(a) GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-53 PWR Disposition Costs for Generators Located in States Not Affiliated with a Compact having a Disposal Facility (2016 dollars)

REFERENCE PWR COMPONENT	BASE DISPOSAL CHARGE	IRRADIATED HARDWARE HANDLE SURCHARGE	CASK HANDLE SURCHARGE	WEIGHT SURCHARGE	CURIE CHARGE	DOSE RATE SURCHARGE	NEW VEN CHG	DISPOSAL COST
VESSEL WALL	0	0	0	0	0	0	748,220	748,220
VESSEL HEAD & BOTTOM	0	0	0	0	0	0	1,667,600	1,667,600
UPPER CORE SUPPORT ASSM	0	0	0	0	0	0	78,760	78,760
UPPER SUPPORT COLUMN	0	0	0	0	0	0	78,760	78,760
UPPER CORE BARREL	200,000	150,000	5,000	0	440,000	60,000	0	855,000
UPPER CORE GRID PLATE	500,000	375,000	12,500	0	1,100,000	150,000	0	2,137,500
GUIDE TUBES	0	0	0	0	0	0	118,140	118,140
LOWER CORE BARREL ^(a)	3,200,000	2,400,000	80,000	0	7,040,000	960,000	0	13,680,000
THERMAL SHIELDS ^(a)	600,000	450,000	15,000	0	1,320,000	180,000	0	2,565,000
CORE SHROUD ^(a)	400,000	300,000	10,000	0	13,420,000	120,000	0	14,250,000
LOWER GRID PLATE ^(a)	500,000	375,000	12,500	0	2,200,000	150,000	0	3,237,500
LOWER SUPPORT COLUMN	100,000	75,000	2,500	0	220,000	30,000	0	427,500
LOWER CORE FORGING	1,100,000	825,000	27,500	0	1,375,000	330,000	0	3,657,500
MISC INTERNALS	800,000	600,000	20,000	80,000	1,100,000	240,000	0	2,840,000
BIO SHIELD CONCRETE	0	0	0	0	0	0	4,914,624	4,914,624
REACTOR CAVITY LINER	0	0	0	0	0	0	100,813	100,813
REACTOR COOLANT PUMPS	0	0	0	0	0	0	1,750,980	1,750,980
PRESSURIZER	0	0	0	0	0	0	1,500,840	1,500,840
R.Hx,EHx,SUMP PUMP,CAVITY PUMP	0	0	0	0	0	0	78,760	78,760
PRESSURIZER RELIEF TANK	0	0	0	0	0	0	236,280	236,280
SAFETY INJECTION ACCUM TANKS	0	0	0	0	0	0	787,600	787,600
STEAM GENERATORS	0	0	0	0	0	0	8,905,818	8,905,818
REACTOR COOLANT PIPING	0	0	0	0	0	0	649,770	649,770
REMAINING CONTAM. MATLS	0	0	0	0	0	0	10,358,515	10,358,515
CONTAMINATED MATRL OTHR BLD	0	0	0	0	0	0	93,943,156	93,943,156
FILTER CARTRIDGES	315,000	0	15,000	0	1,320,000	31,500	0	1,681,500
SPENT RESINS	2,000,000	0	50,000	0	4,400,000	600,000	0	7,050,000
COMBUSTIBLE WASTES - CLASS A	0	0	0	0	0	0	4,772,295	4,772,295
COMBUSTIBLE WASTES - CLASS B	3,150,000	0	150,000	0	288,750	315,000	0	3,903,750
EVAPORATOR BOTTOMS	0	0	0	0	0	0	1,933,839	1,933,839
POST-TMI-2 ADDITIONS	0	0	0	0	0	0	3,062,992	3,062,992
SUBTOTAL BWR COSTS	12,865,000	5,550,000	400,000	80,000	34,223,750	3,166,500	135,687,762	191,973,012
OUT-OF-COMPACT TAXES & FEES (% OF CHARGES)								32,364,019
TOTAL PWR COSTS								224,337,030

^{a)} GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

Table B-54 BWR Disposition Costs for Generators Located in States Not Affiliated with a Compact having a Disposal Facility (2016 dollars)

REFERENCE BWR COMPONENT	BASE DISPOSAL CHARGE	IRRADIATED HARDWARE HANDLE SURCHARGE	CASK HANDLE SURCHARGE	WEIGHT SURCHARGE	CURIE CHARGE	DOSE RATE SURCHARGE	NEW VEN CHG	DISPOSAL COST
STEAM SEPARATOR	353,146	1,050,000	70,000	0	3,083,000	141,258	0	4,697,404
FUEL SUPPORT & PIECES	176,573	525,000	35,000	0	385,185	52,972	0	1,174,730
CONTROL RODS/INCORES	529,719	600,000	20,000	0	1,802,000	211,888	0	3,163,607
CONTROL RODS GUIDES	0	0	0	0	0	0	27,814	27,814
JET PUMPS	494,404	1,500,000	100,000	0	4,412,880	197,762	0	6,705,046
TOP FUEL GUIDES	847,550	5,400,000	180,000	0	15,928,800	339,020	0	22,695,371
CORE SUPPORT PLATE	0	0	0	0	0	0	76,488	76,488
CORE SHROUD ^{a)}	1,659,786	10,500,000	350,000	0	33,479,000	663,914	0	46,652,701
REACTOR VESSEL WALL	0	0	0	0	0	0	55,628	55,628
SAC SHIELD Neutron-Activated Matl	0	0	0	0	0	0	625,810	625,810
REACT. WATER REC	0	0	0	0	0	0	611,903	611,903
SAC SHIELD Contaminated Matl	0	0	0	0	0	0	2,155,568	2,155,568
OTHER PRIMARY CONTAINMENT	0	0	0	0	0	0	24,587,381	24,587,381
CONTAINM. ATMOSPHERIC	0	0	0	0	0	0	333,765	333,765
HIGH PRESSURE CORE SPRAY	0	0	0	0	0	0	118,209	118,209
LOW PRESSURE CORE SPRAY	0	0	0	0	0	0	69,534	69,534
REACTOR BLDG CLOSED COOLING	0	0	0	0	0	0	222,510	222,510
REACTOR CORE ISO COOLING	0	0	0	0	0	0	90,395	90,395
RESIDUAL HEAT REMOVAL	0	0	0	0	0	0	431,114	431,114
POOL LINER & RACKS	0	0	0	0	0	0	2,649,262	2,649,262
CONTAMINATED CONCRETE	0	0	0	0	0	0	3,017,795	3,017,795
OTHER REACTOR BUILDING	0	0	0	0	0	0	9,866,938	9,866,938
TURBINE	0	0	0	0	0	0	20,700,055	20,700,055
NUCLEAR STEAM CONDENSATE	0	0	0	0	0	0	2,524,100	2,524,100
LOW PRESSURE FEEDWATER HEATERS	0	0	0	0	0	0	5,124,689	5,124,689
MAIN STEAM	0	0	0	0	0	0	493,695	493,695
MOISTURE SEPARATOR REHEATERS	0	0	0	0	0	0	4,971,713	4,971,713
REACTOR FEEDWATER PUMPS	0	0	0	0	0	0	2,856,195	2,856,195
HIGH PRESSURE FEEDWATER HEATERS	0	0	0	0	0	0	841,367	841,367
OTHER TG BLDG	0	0	0	0	0	0	33,772,881	33,772,881
RAD WASTE BLDG	0	0	0	0	0	0	16,723,035	16,723,035
REACTOR BLDG - CLASS A	0	0	0	0	0	0	1,438,320	1,438,320
REACTOR BLDG - CLASS B	3,285,317	0	160,000	0	304,563	328,532	0	4,078,411
TG BLDG - CLASS A	0	0	0	0	0	0	971,049	971,049
TG BLDG - CLASS B	2,217,404	0	105,000	0	205,563	221,740	0	2,749,707
RAD WASTE & CONTROL - CLASS A	0	0	0	0	0	0	838,168	838,168
RAD WASTE & CONTROL - CLASS B	1,913,345	0	95,000	0	177,375	191,335	0	2,377,055
CONCENTRATOR BOTTOMS - CLASS A	0	0	0	0	0	0	477,807	477,807
CONCENTRATOR BOTTOMS - CLASS B	5,226,561	0	130,000	520,000	11,440,000	640,480	0	17,957,041
OTHER	0	0	0	0	0	0	1,209,899	1,209,899
POST-TMI-2 ADDITIONS	0	0	0	0	0	0	250,324	250,324
SUBTOTAL BWR COSTS	16,703,806	19,575,000	1,245,000	520,000	71,218,365	2,988,901	138,133,410	250,384,482
OUT-OF-COMPACT TAXES & FEES (% OF CHARGES)								64,544,366
TOTAL PWR COSTS								314,928,849

^{a)} GTCC Material: Assumes a low-density, distributed packaging scheme and final disposal as LLW. High-density packaging, ISFSI storage, and geologic repository disposal could reduce disposal costs.

APPENDIX C

BUREAU OF LABOR STATISTICS ON THE INTERNET

APPENDIX C

BUREAU OF LABOR STATISTICS ON THE INTERNET

For use in the adjustment formula in Chapter 0, the labor indexes for the first quarter of 2016 and the producer price indexes for March 2016 were obtained from the Bureau of Labor Statistics (BLS) data on the Internet.

These dates were chosen to agree, to the extent possible, with the effective dates of the waste burial rate schedules. Instructions for accessing and obtaining the specific indexes used in this report follow below.

Bureau of Labor Statistics Internet Data Page

To obtain reports of producer price indexes and labor indexes, proceed as follows:

1. Enter the URL: <http://www.bls.gov/data/>
2. Click on the item labeled *Series Report*.
3. In the box labeled *Enter series id(s) below*, type in the following six series identifications (IDs), one ID per line:

Series ID

wpu0543

wpu0573

Producer Price Indexes

(Industrial electric power—used in calculation of P_x , per Section 3.2)

(Light fuel oils—used in calculation of F_x per Section 3.2)

Labor Indexes (Used in the calculation of L_x , per Section 3.1)

CIU2010000000210I

CIU2010000000220I

CIU2010000000230I

CIU2010000000240I

(Total compensation, private industry, Northeast region)

(Total compensation, private industry, South region)

(Total compensation, private industry, Midwest region)

(Total compensation, private industry, West region)

4. Click the button labeled *Next*.
5. In the box labeled *Select view of the data*, use *Table Format* and *Original Data value*.
6. In the box labeled *Select the time frame for your data*, specify the years you want and time period.
7. Click on the button labeled *Retrieve Data* and the six tables of data you requested will be displayed

APPENDIX D

REPRESENTATIVE EXAMPLES OF DECOMMISSIONING COSTS FOR 2004 THROUGH 2016

APPENDIX D

REPRESENTATIVE EXAMPLES OF DECOMMISSIONING COSTS FOR 2004 THROUGH 2016

In Section 3.4 of this revision and the five previous revisions of NUREG-1307, decommissioning costs for four typical situations were developed. Results of these calculations are summarized below.

Example 1 (Compact-Affiliated Disposal Facility Only)

Reactor Type: Boiling-Water Reactor (BWR)						
Thermal Power Rating: 3400 Megawatt Thermal (MW _{th})						
Location of Plant: Northwest Compact						
LLW Burial Location: Washington						
	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>2010</u>	<u>2012</u>	<u>2016</u>
L _x	1.984	2.11	2.23	2.29	2.38	2.60
E _x	1.496	2.206	2.853	2.181	2.795	1.632
B _x	13.157	11.702	23.185	7.423	6.704	7.290
Decommissioning Cost (Millions)	\$591	\$571	\$934	\$460	\$457	\$473

Example 2 (Compact-Affiliated Disposal Facility Only)

Reactor Type: Pressurized-Water Reactor (PWR)						
Thermal Power Rating: 3400 MW _{th}						
Location of Plant: Atlantic Compact						
LLW Burial Location: South Carolina (Atlantic Compact)						
	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>2010</u>	<u>2012</u>	<u>2016</u>
L _x	2.070	2.21	2.33	2.41	2.52	2.75
E _x	1.483	2.152	2.746	2.139	2.704	1.645
B _x	19.500	22.933	25.231	27.292	30.581	30.061
Decommissioning Cost (Millions)	\$612	\$710	\$779	\$824	\$915	\$905

Example 3 (Combination of Compact-Affiliated and Non-Compact Disposal Facilities)

Reactor Type: PWR						
Thermal Power Rating: 3400 MW _{th}						
Location of Plant: Atlantic Compact						
LLW Burial Location: South Carolina (Atlantic Compact)						
	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>2010</u>	<u>2012</u>	<u>2016</u>
L _x	2.070	2.21	2.33	2.41	2.52	2.75
E _x	1.483	2.152	2.746	2.139	2.704	1.645
B _x	7.790	8.600	9.872	12.280	13.885	10.971
Decommissioning Cost (Millions)	\$341	\$379	\$425	\$477	\$530	\$464

Example 4 (Non-Compact Disposal Facilities)

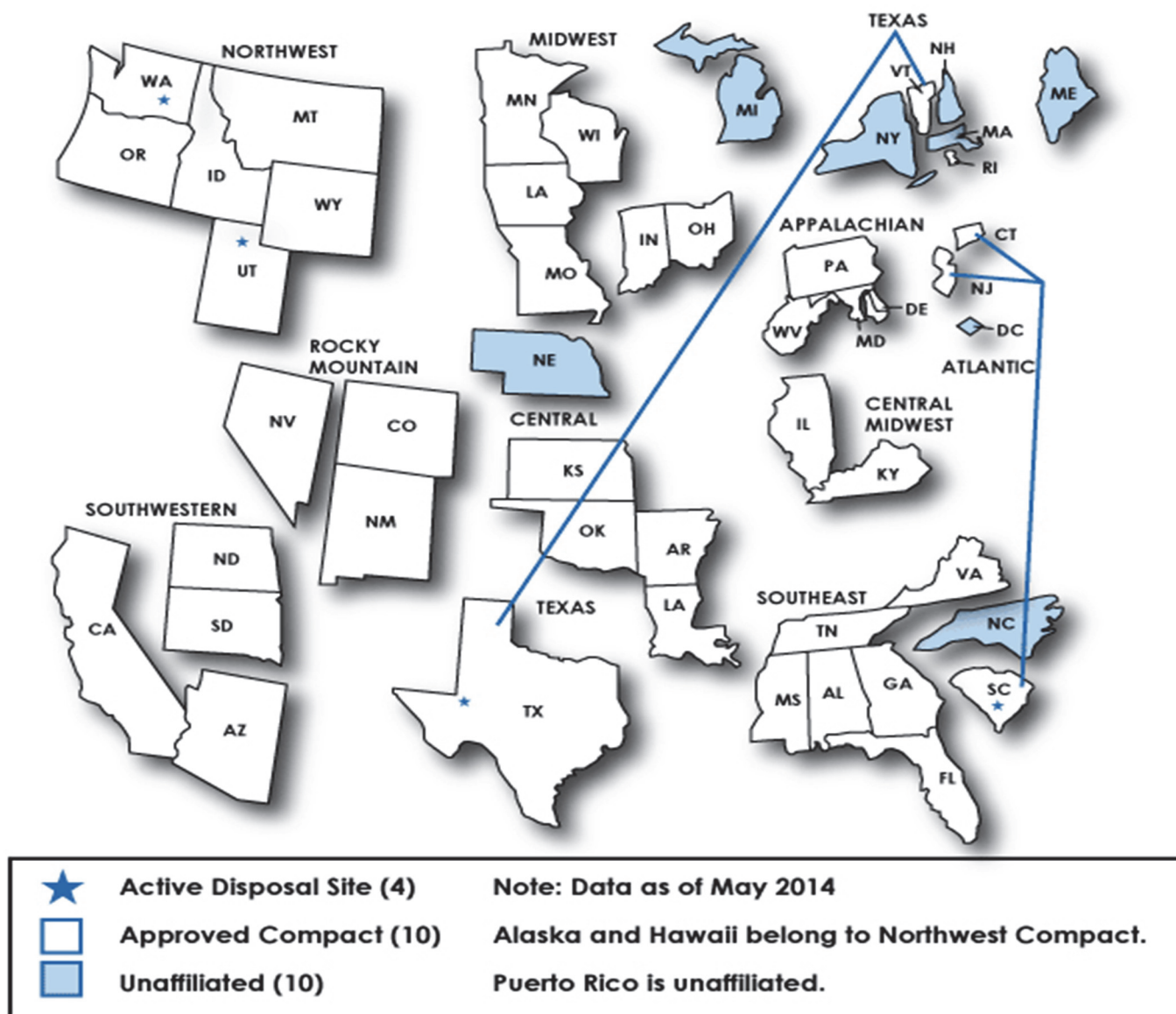
Reactor Type: BWR						
Thermal Power Rating: 3400 MW _{th}						
Location of Plant: Midwest Compact						
LLW Burial Location: Before 2008—South Carolina (Non-Atlantic Compact); 2008 to 2012—Unknown (Generic LLW Disposal Site); Beginning 2016—Non-Compact Disposal Facilities						
	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>2010</u>	<u>2012</u>	<u>2016</u>
L _x	2.002	2.13	2.23	2.29	2.39	2.57
E _x	1.496	2.206	2.853	2.181	2.795	1.632
B _x	8.863	10.206	11.198	12.540	14.160	13.132
Decommissioning Cost (Millions)	\$465	\$529	\$578	\$612	\$679	\$644

APPENDIX E
LOW-LEVEL WASTE COMPACT

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LOW-LEVEL WASTE COMPACTS

The figure and table below identify the composition of all LLW compacts as of May 2010
(source: NRC, <http://www.nrc.gov/waste/llw-disposal/licensing/compacts.html>).



Compact		Affiliated States		
Northwest	Alaska	Idaho	Oregon	Washington ^(a)
	Hawaii	Montana	Utah	Wyoming
Southwestern	Arizona	California ^(b)	North Dakota	South Dakota
Rocky Mountain	Colorado	New Mexico	Nevada	
Midwest	Indiana	Minnesota	Ohio	Wisconsin
	Iowa	Missouri		
Central	Arkansas	Louisiana	Nebraska ^(b)	Oklahoma
	Kansas			
Texas	Texas ^(a)	Vermont		
Central Midwest	Illinois ^(b)	Kentucky		
Appalachian	Delaware	Maryland	Pennsylvania ^(b)	West Virginia
Atlantic	Connecticut ^(b)	New Jersey ^(b)	South Carolina ^(a)	
Southeast	Alabama	Georgia	Tennessee	Virginia
	Florida	Mississippi		
Unaffiliated States	District of Columbia	Michigan ^(b)	New York ^(b)	Rhode Island
	Massachusetts ^(b)	New Hampshire	Puerto Rico	North Carolina ^(b)
	Maine			
(a) Current Host State (3 States)				
(b) Selected Host State (10 States)				

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