

**ECONOMIC EVALUATION OF NUCLEAR WASTE UNDERGROUND EMPLACEMENT
CONCEPTS**

by

Gabriela R. Coe

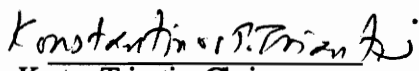
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APPROVED:


Dr. Kostas Triantis, Chairman


Dean Benjamin S. Blanchard


Perry L. Friedman

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Blacksburg, Virginia

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Committee Chairman: Dr. Kostas Triantis

Industrial and Systems Engineering

(ABSTRACT)

An economic evaluation of nuclear waste underground storage facility is presented. The underground storage facility is a subsystem of the Civilian Radioactive Waste Management System (CRWMS) currently under development in the United States. The evaluation considers two nuclear waste emplacement concepts for the underground facility: Vertical Borehole Emplacement and In-Drift Emplacement. Since the two concepts are of unequal lives, several cases were established in order to perform an economic comparison. A discussion of the underground facility life-cycle is provided. A detailed description of the assumptions and methodology used for cost estimating, and an analysis of the results is also provided. A complete set of calculations for each case is given in the appendix.

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CHAPTER 1

DESCRIPTION OF THE UNDERGROUND WASTE EMPLACEMENT CONCEPTS

This report provides an economic evaluation of nuclear waste underground storage facility which is a subsystem of the Civilian Radioactive Waste Management System (CRWMS) currently under development in the United States. The CRWMS consists of two major subsystems: transportation and geologic repository systems. The geologic repository system is further broken down into surface and underground facilities which are connected by shafts and ramps. The objective of this study is to focus on the underground facility portion of the geologic repository. Two design concepts for the underground facility are evaluated and compared based on economic feasibility.

The following sections provide a background of how the nuclear waste management system evolved, and a description of the baseline and alternative nuclear repository underground facility waste emplacement design configurations.

1.1 Background

Commercial nuclear power plants generate roughly 20% of the nation's electricity. Most of these plants use nuclear materials in the form of uranium fuel pellets encased in metal fuel rods. After the energy has been released from the fuel rods, they remain as a solid, highly radioactive waste called "spent fuel." These rods are then removed from the reactor and stored under water in a special spent-fuel pool at the reactor site. The spent fuel will remain radioactive for thousands of years, and, while it is safely stored now, it must be isolated from the human environment.

There are two types of nuclear waste: the spent fuel generated by commercial reactors and the high-level waste mostly generated in defense activities. A large quantity of spent fuel has accumulated at the reactor sites, approximately 20,000 metric tons of uranium. This amount is expected to double by the year 2,000. It is estimated that by the time the last license for the current generation of nuclear reactors expires, the amount of spent fuel would have increased to approximately 86,000 metric tons of uranium. The high-level waste generated by defense activities is estimated to be approximately 8,900 metric tons of uranium.

It is necessary to have a system for the permanent disposal of these wastes. Permanent disposal is important to protecting public health and safety and the environment. Congress assigned responsibility for providing permanent disposal of nuclear waste to the U.S. Department of Energy in the Nuclear Waste Policy Act of 1982. The Act created the Office of Civilian Radioactive Waste Management (OCRWM) for that purpose and authorized the development of a nuclear waste management system. In 1987, the Nuclear Waste Policy Amendments Act streamlined and focused the program by specifying one site, Yucca Mountain in Nevada. This site is to be scientifically evaluated as a candidate site for a nuclear waste geologic repository.

The waste management system consists of three major components: a geologic repository, an interim storage system, and a system for transporting the waste. Figure 1-1 depicts the waste management system concept.

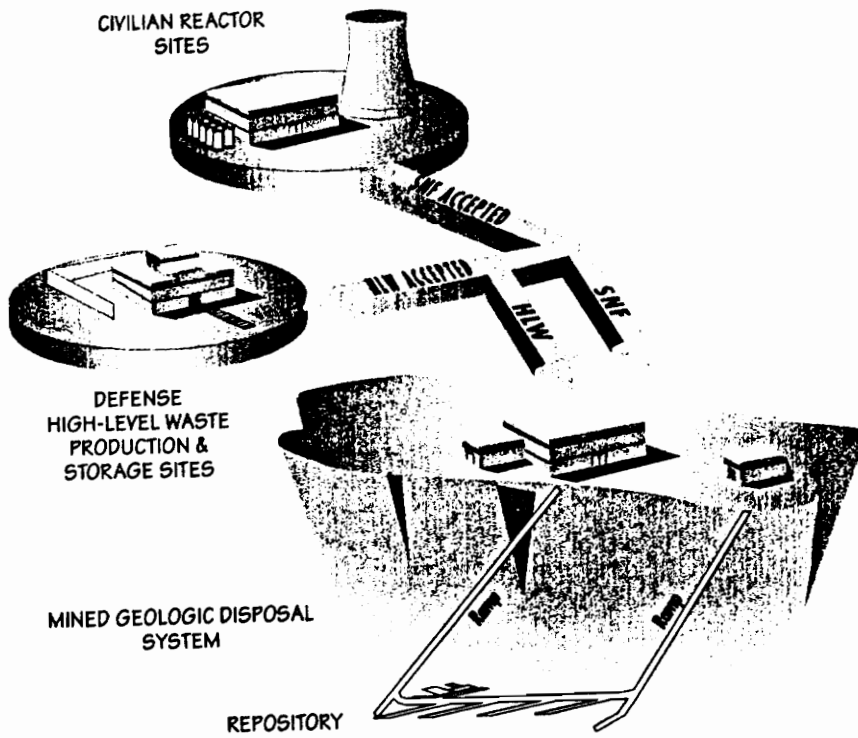


Figure 1-1 - Waste Management System Concept

1.2 Description of the Geologic Repository

The repository will be made up of three major components, each providing barriers for waste isolation. The three components are: the natural system or host rock in which the repository will be constructed; the repository, which consists of various underground structures where the waste will be emplaced and; the waste package, which consists of the waste form, the disposal container, and any other materials designed to separate the waste form from the host rock.

The repository consists of surface, underground facilities, and shafts and ramps which connect the surface and underground facilities. The purpose of the surface facilities would be to receive the waste and to prepare it for permanent disposal. A waste-handling building equipped for receiving and inspecting waste and transferring it underground would also be part of the surface

facilities. Additionally, the surface facilities would also provide various support functions, such as utilities, ventilation, and administration.

The underground facilities would be constructed at a depth of about 1,000 feet below the surface. The underground facilities consist of main horizontal passageways or drifts, excavated parallel to one another. Each of these drifts would serve a number of waste emplacement panels, which would consist of a number of rooms in which the waste would be emplaced.

The waste emplaced in the repository must be retrievable for a certain period of time. During this period, tests will be conducted to ensure that the repository is performing as expected. When these tests are completed and a closure license is obtained from the proper authorities, the repository will be prepared for permanent closure. Permanent closure will be achieved by sealing the shafts and ramps, decontaminating and decommissioning the surface facilities, and returning the surface above the repository to its natural state. Permanent site markers will be installed to warn future generations of the presence of a repository.

1.3 Underground Facilities

Once the waste is received at the surface facilities it would be unloaded from the transportation cask and loaded into a transporter to be taken to the underground facility. The underground facilities consist of the main drifts, perimeter drifts, entries, waste emplacement panels and drifts, and service facilities (SANDIA, 1987) [Reference 2].

The following components will make up the underground facilities (SANDIA, 1987)

[Reference 2]:

- emplacement areas for the spent fuel;
- service areas and facilities for the development activities;
- service areas and facilities for the waste emplacement activities;
- training area in the waste emplacement area for waste emplacement personnel;
- dedicated performance confirmation area;
- main entries for all development and waste emplacement functions; and
- an underground worker training area for construction and mining personnel.

The layout of the underground facility shall allow for new emplacement area construction and waste emplacement operations to occur simultaneously. Additionally, the design shall permit retrieval of the waste in accordance with the performance objectives set forth by federal regulations. Any or all of the emplaced waste may be required to be retrieved on a reasonable schedule starting at any time up to 100 years after waste emplacement operations are initiated. The conceptual design for the underground facility layout is shown in Figure 1-2.

The repository underground facility emplacement design configurations to be evaluated are: vertical borehole emplacement (baseline design), and the in-drift emplacement (alternative design). A description of the two emplacement configurations is given below.

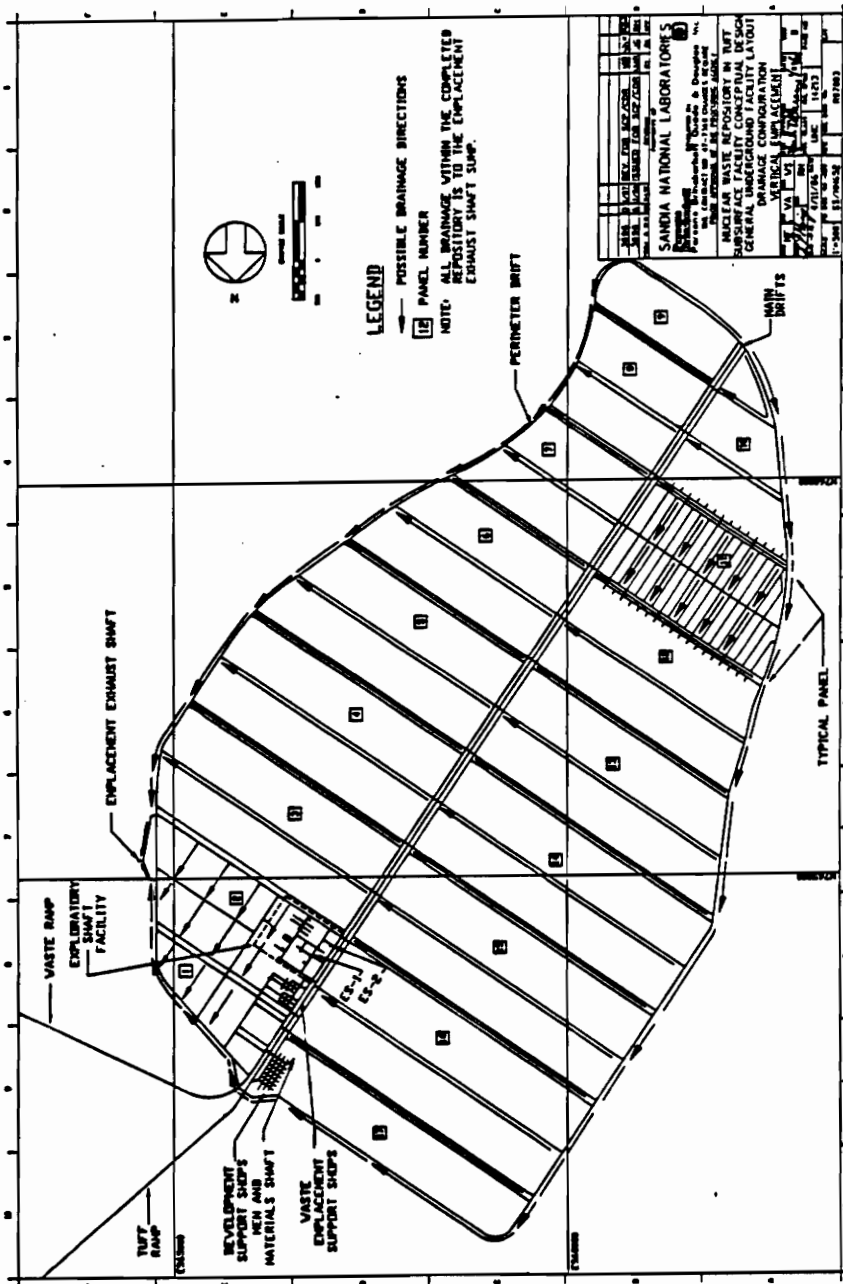


Figure 1-2 - Conceptual Design Underground Facility Layout

1.3.1 The Vertical Boreholes Emplacement Concept (Baseline design)

The emplacement panel in the vertical configuration consists of a series of equally spaced emplacement drifts or rooms. Vertical holes will be bored into the floor of these rooms into which the waste packages will be inserted. Figure 1-3 depicts the vertical borehole emplacement design concept.

Emplacement boreholes are prepared well in advance of the disposal operations as part of the requirement to isolate waste disposal from the subsurface development operations and ventilation streams. Vertical boreholes are prepared by first drilling large diameter holes on the vertical centerline of the emplacement drifts to the design depth, sufficient to accept the waste package and a closure plug. The upper half of the borehole then receives a steel liner attached to a support plate. To the collar end of the liner, a shielding closure is installed to provide a means for isolating the waste package during the emplacement operations.

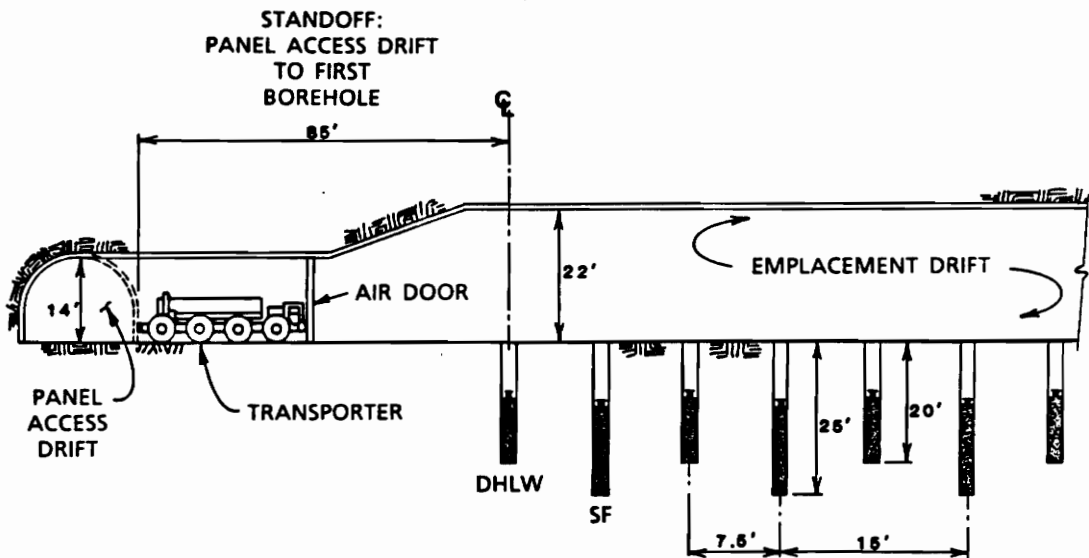


Figure 1-3 - Vertical Borehole Emplacement Concept

The basic operations required to emplace a waste package include (SANDIA, 1986) [Reference 3]:

- preparing the waste emplacement borehole;
- loading the waste package into a transporter cask at the surface facility;
- moving the loaded transporter underground through an access ramp to the vertical borehole;
- lowering the waste package through a temporary shielding mechanism into the borehole;
- installing a shielding device above the emplaced waste package;
- removing the temporary shielding mechanism; and
- installing a cover on the borehole.

During retrieval operations, the above steps will be performed in reverse. The emplacement operations described above are illustrated in Figure 1-4.

1.3.2 The In-Drift Emplacement Concept (Alternative design)

The emplacement panel in this configuration is the same as in the baseline concept. Waste packages will be emplaced in the open inside the emplacement drifts. No special boreholes would be constructed to isolate individual waste packages from the travelway inside the emplacement drift. In this concept, large multi-barrier (Multi-Purpose Canisters) waste packages with high heat outputs would be placed lengthwise along the centerline of the emplacement drift. Figure 1-5 depicts the in-drift emplacement design concept.

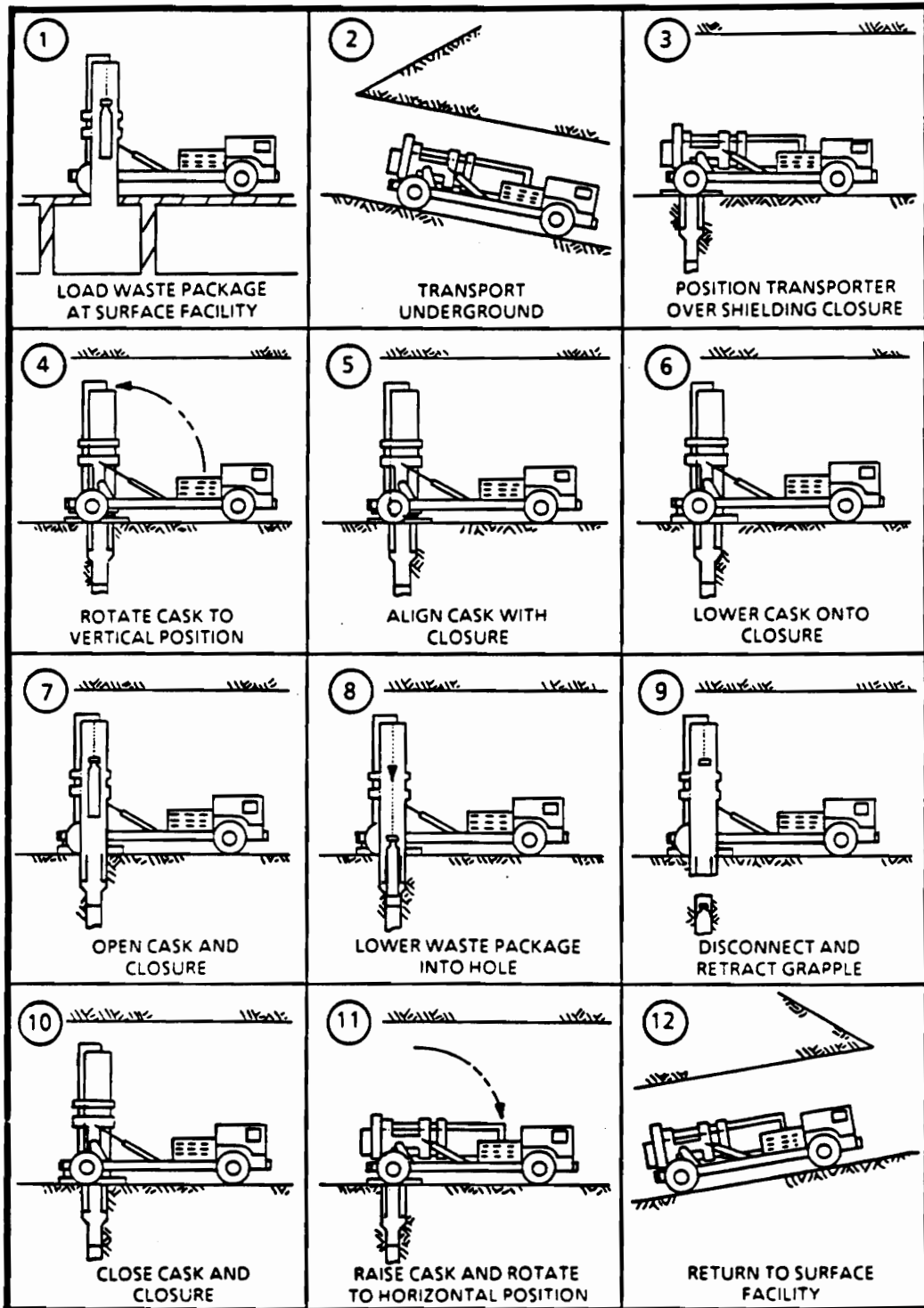


Figure 1-4 - Vertical Borehole Emplacement Operations

To accommodate the MPC waste package disposal, the underground operations would be as follows (TRW, 1993) [Reference 6]:

- fully prepared waste packages will be moved to a surface transfer vault to wait for the underground transporter;
- The transporter will descend the waste haulage ramp to the waste emplacement drift. The transporter will be under the control of the on-board operator assisted by position, alignment, and speed sensors.
- The drifts will be in radiation controlled areas since the waste emplacement rooms will contain packages emitting radiation beyond minimum limits. Access to the drifts will be tightly controlled by radiation locks and the transporter will become remotely controlled once it goes beyond the radiation locks.
- The waste transporter will be positioned under precise controls at the emplacement machine. The MPC waste package will be transferred and the transporter released.
- The transporter will pass through the radiation lock and be driven by the operator to the surface to begin another cycle.
- The emplacement machine carrying the MPC waste package will move to the

specified disposal site under automated control. It will place the the waste package in position with the aid of sensing devises. After off loading, the emplacement machine will move back to the transfer area.

During retrieval operations, the above steps will be performed in reverse.

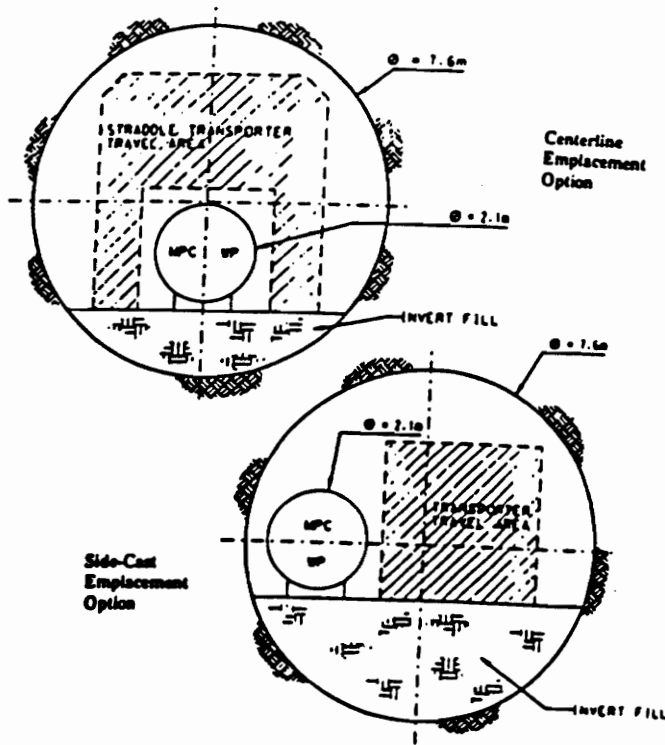


Figure 1-5 - In-Drift Emplacement Concept

The organization of this report is as follows: Chapter 1 describes, in detail, the two nuclear waste emplacement concepts being evaluated. Chapter 2 focuses on describing the underground facility of the nuclear waste repository as a systems engineering concept. Chapter 3 explains the approach and

methodology used in evaluating and comparing the two nuclear waste emplacement concepts. It also describes the cost model used (URCOST), and cites the data sources. Chapter 4 presents the results obtained from URCOST and the analysis of the data. In Chapter 5, conclusions about the analysis are made.

CHAPTER 2

UNDERGROUND NUCLEAR WASTE EMPLACEMENT CONCEPTS AS SYSTEMS ENGINEERING MODELS

A systems engineering approach was used in developing and evaluating underground waste emplacement concepts for the nuclear waste disposal system. The underground facility of the nuclear waste repository is a sub-system of the Civilian Radioactive Waste Management System (CRWMS). Two underground waste emplacement concepts, namely the Vertical Borehole and In-Drift, are being evaluated to determine their feasibility for implementation into the CRWMS.

The approach began by performing functional analyses and identifying the overall systems requirements. Based on these requirements, an overall CRWMS concept was developed for disposal of nuclear waste in a geologic repository. The geologic repository concept yielded the need for a waste emplacement concept. Operating concepts and requirements were then defined and allocated to each system element to ensure proper integration with the overall CRWMS concept. Using these operating concepts and requirements, conceptual designs were developed for the underground emplacement sub-system. Systems studies and analyses are then performed to determine the impact of the underground facility configuration on the overall CRWMS. These studies provide a complete analysis of the effect of implementing the underground facility configuration, and are the basis for decision making.

An implied objective of this report is to define the scope of the underground facility emplacement concepts as related to the systems engineering process (Blanchard and Fabrycky, 1990) [Reference 1]. The emplacement concept/systems engineering process relationship is detailed in the following paragraphs.

2.0 Definition of Need

Most nuclear power plants use nuclear materials in the form of uranium pellets encased in metal fuel rods to generate electricity. After the energy has been released from the fuel rods, they remain as a solid, highly radioactive waste called "spent fuel." These rods are then removed from the reactor and stored under water in special spent fuel pools at the reactor site. The spent fuel remains radioactive for thousands of years, and, while it is safely stored now, it must be isolated from the human environment. It is, therefore, necessary to have a system for the permanent disposal of nuclear wastes. Permanent disposal is important for protecting public health and safety and the environment.

2.1 Definition of Systems Requirements

Systems requirements were defined by U.S. Department of Energy (USDOE). The repository will be made up of three major components, each providing barriers for waste isolation. The three components are: the natural system or host rock in which the repository will be constructed; the repository, which consists of various underground structures where the waste will be emplaced and; the waste package, which consists of the waste form, the disposal container, and any other materials designed to separate the waste form from the host rock.

The repository consists of surface, underground facilities, and shafts and ramps which connect the surface and underground facilities. The purpose of the surface facilities would be to receive the waste and to prepare it for permanent disposal. A waste-handling building equipped for receiving and inspecting waste and transferring it underground would also be part of the surface facilities. Additionally, the surface facilities would provide various support functions, such as utilities, ventilation, and administration.

The underground facilities would be constructed at a depth of about 1,000 feet below the surface. The underground facilities consist of main horizontal passageways or drifts, excavated parallel to one another. Each of these drifts would serve a number of waste emplacement panels, which would consist of a number of rooms in which the waste would be emplaced. These rooms will house approximately 86,000 metric tons of uranium generated by commercial reactors and 8,900 metric tons of uranium generated by defense activities.

The waste emplaced in the repository must be retrievable for a certain period of time. During this period, tests will be conducted to ensure that the repository is performing as expected. When these tests are completed and a closure license is obtained from the proper authorities, the repository will be prepared for permanent closure. Permanent closure will be achieved by sealing the shafts and ramps, decontaminating and decommissioning the surface facilities, and returning the surface above the repository to its natural state. Permanent site markers will be installed to warn future generations of the presence of a repository.

2.2 System Design and Development

The system design consists of four design phases: conceptual design, advanced conceptual design, license application design, and procurement and construction design. The conceptual design of the underground facility is described below.

Once the waste is received at the surface facilities it would be unloaded from the transportation cask and loaded into a transporter to be taken to the underground facility. The underground facilities consist of the main drifts, perimeter drifts, entries, waste emplacement panels and drifts, and service facilities (SANDIA, 1987) [Reference 2].

The layout of the underground facility shall allow for new emplacement area construction and waste emplacement operations to occur simultaneously. Additionally, the design shall permit retrieval of the waste in accordance with the performance objectives set forth by federal regulations. Any or all of the emplaced waste may be required to be retrieved on a reasonable schedule starting at any time up to 100 years after waste emplacement operations are initiated.

Currently, there are two underground facility emplacement designs under evaluation. These designs are: vertical borehole emplacement (baseline design), and the in-drift emplacement (alternative design).

The objective in the advanced conceptual design phase is to develop appropriate solutions to the design-related licensing issues identified through consultation with the Nuclear Regulatory Commission (NRC).

Resolution of design and licensing issues identified in earlier phases should be completed in the licensing application phase. This phase is also intended to develop the design of the items necessary to demonstrate compliance with the design requirements and performance objectives set forth by federal regulations.

The procurement and construction design phase is intended to develop the final drawings and specifications for procurement and construction. Emphasis on the completion of design of supplementary support items, final design refinement for the items necessary to demonstrate compliance with the design criteria and performance objectives set forth by federal regulations will take place during this phase.

2.3 Production and/or Construction

As mentioned above, the underground facilities would be constructed at a depth of about 1,000 feet below the surface. The underground facilities consist of main horizontal passageways or drifts, excavated parallel to one another. Each of these drifts would serve a number of waste emplacement panels, which would consist of a number of rooms in which the waste would be emplaced.

For the Vertical Borehole Emplacement concept, vertical holes would be bored into the floor of the emplacement rooms or drifts and the waste would be inserted in them. Emplacement boreholes are prepared well in advance of disposal operations as part of the requirement to isolate waste disposal from the subsurface development operations and ventilation streams. Vertical boreholes are prepared by first drilling large diameter holes on the vertical centerline of the emplacement drifts to a design depth of 7.6 meters, sufficient to accept the waste package and a closure plug. The upper half of the borehole then receives a steel liner attached to a support plate. To the collar end of the liner, a shielding closure is installed to provide a means for isolating the waste package during the emplacement operations.

The In-Drift Emplacement concepts requires no special boreholes to be constructed to isolate individual waste packages from the travelway inside the emplacement drift. In this concept, large multi-barrier (Multi-Purpose Canisters, MPCs) waste packages with high heat outputs would be placed lengthwise along the centerline of the emplacement drift. A more detailed description of these concepts was presented in Chapter 1.

2.4 System Use and Sustaining Support

The basic operations required by both emplacement concepts are very similar. Once the waste is packaged properly and is ready to be disposed, it will be loaded into a transporter cask at the surface facility and transferred to the underground emplacement area.

In the vertical borehole concept, the waste package will be lowered into the borehole. Additional shielding will be provided by installing a shielding device directly above the waste package and then covering the borehole. In the in-drift concept, the waste package will be placed right along the centerline of the emplacement drift. Additional shielding will not be necessary since the MPC provides sufficient isolation of the waste.

The waste emplaced in the repository must be retrievable for a certain period of time. During this period, tests will be conducted to ensure that the repository is performing as expected. When these tests are completed and a closure license is obtained from the proper authorities, the repository will be prepared for permanent closure. Permanent closure will be achieved by sealing the shafts and ramps, decontaminating and decommissioning the surface facilities, and returning the surface above the repository to its natural state. Permanent site markers will be installed to warn future generations of the presence of a repository. Figure 2-1 depicts the system life-cycle of the underground sub-system (Blanchard and Fabrycky, 1990) [Reference 1].

This report will provide an evaluation of the two nuclear waste emplacement concepts based on economic feasibility. Further, a comparison of the two unequal lives concepts will be performed. The approach used in this comparison is defined in Chapter 3.

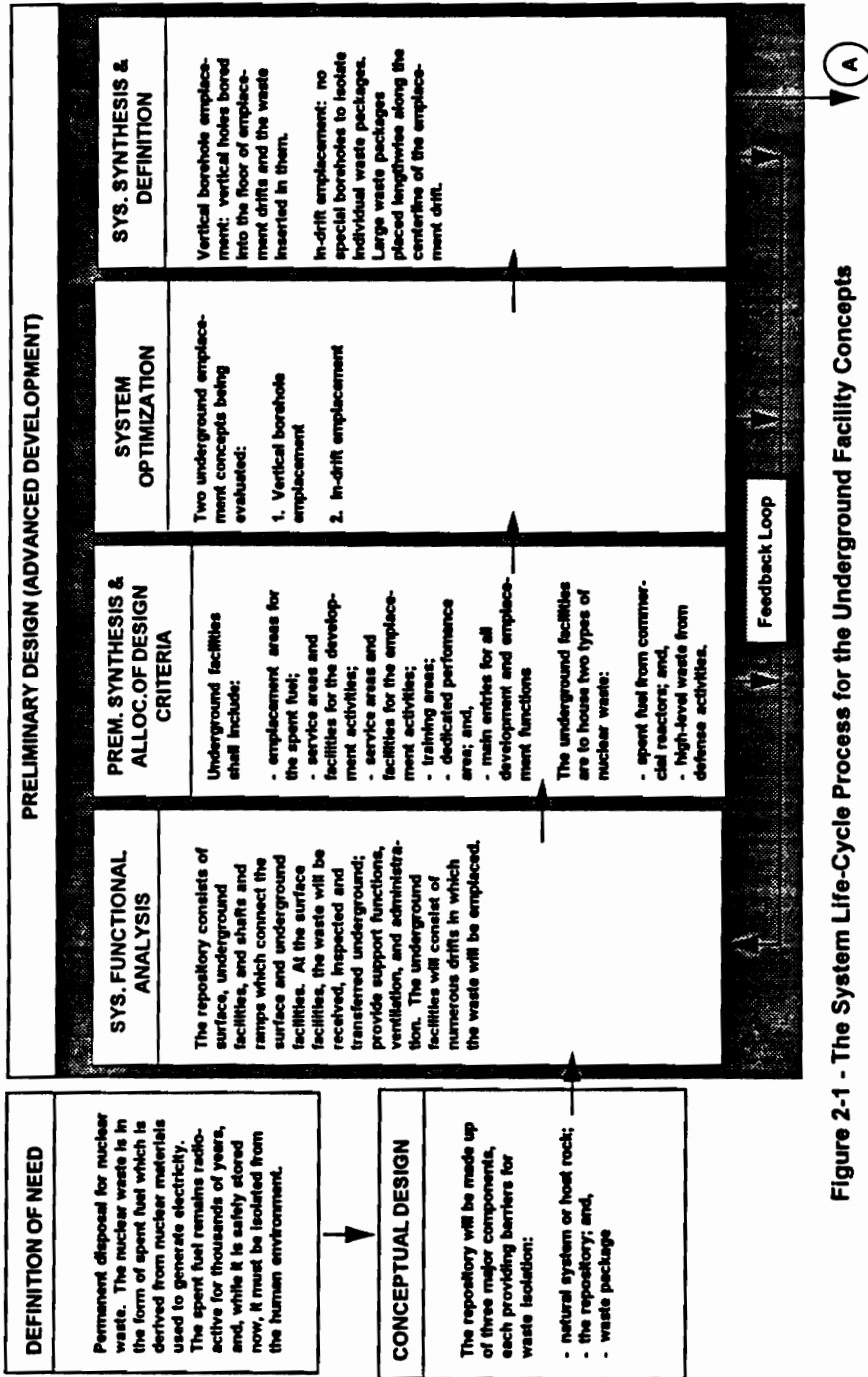


Figure 2-1 - The System Life-Cycle Process for the Underground Facility Concepts

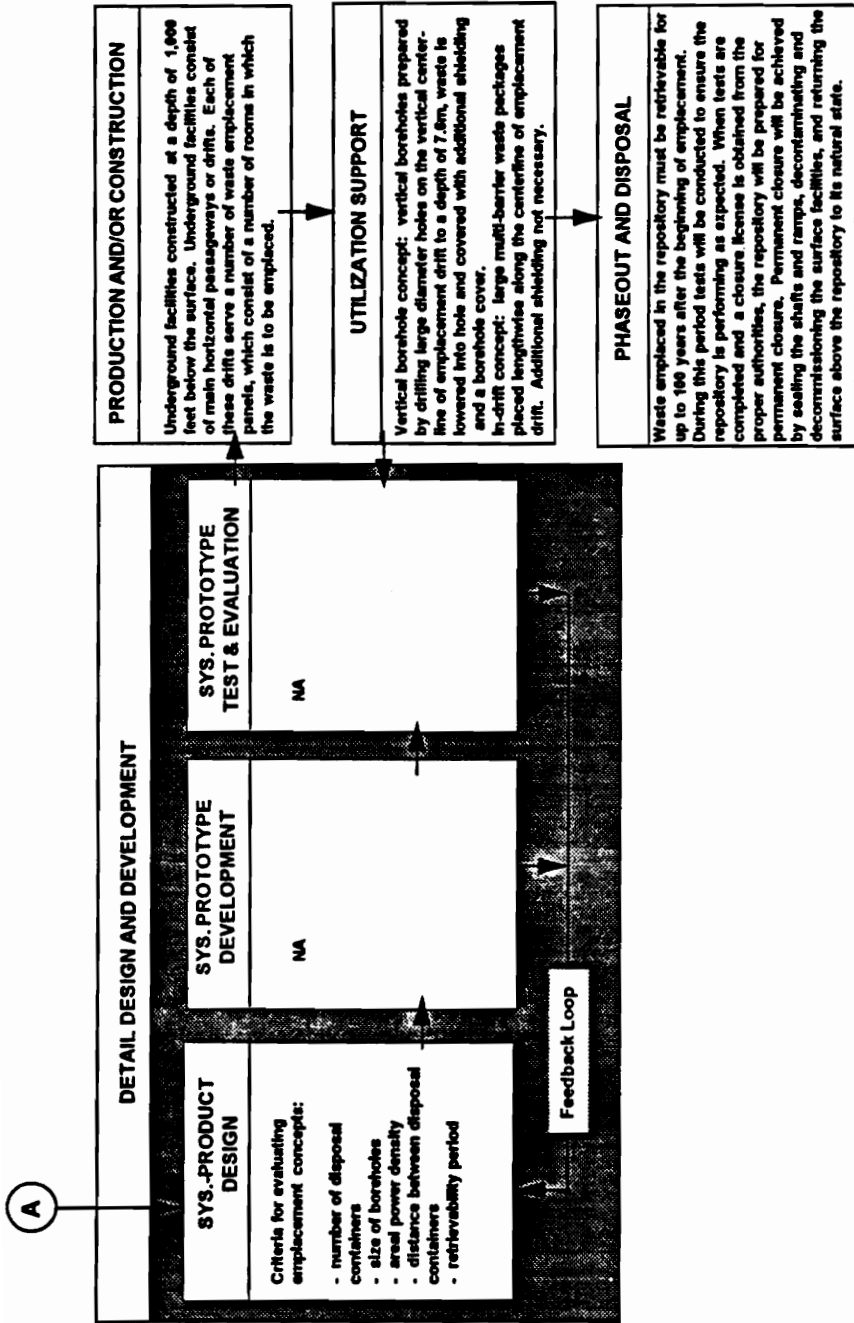


Figure 2-1 - The System Life-Cycle Process for the Underground Facility Concepts (Continued)

CHAPTER 3

CRITERIA AND METHODOLOGY

This chapter explains the criteria and methodology used in calculating costs for the repository underground facility. As mentioned in Chapters 1 and 2, the repository consists of surface and underground facilities, and shafts and ramps. This report is limited to evaluating and comparing costs for the underground facilities based on waste emplacement configuration: Vertical boreholes vs. In-drift.

3.0 Data Sources

The underground facility for the geologic repository is primarily based on information contained in case 4 of the *MRS (Monitored Retrievable Storage) System Study* (SANDIA, 1990) [Reference 3], with additional design and tunnel boring machine excavation data taken from Option 30 of the *ESF (Exploratory Studies Facility) Alternative Study: Final Report* (SANDIA, 1991) [Reference 5] prepared by the project site. These studies were conducted by the Department of Energy (DOE).

3.1 Criteria for Evaluation of Design Concepts

Analyses performed previously by various parties defined a set of criteria used in evaluating life-cycle costs for the repository system. A subset of these criteria was determined necessary for the purposes of this report. The following criteria will be used in calculating costs for the repository underground facility design concepts:

- Number of disposal containers
- Size of boreholes
- Areal Power Density (APD)
- Distance between disposal containers
- Retrievability period

The number of disposal containers to be emplaced depends on the quantity of spent fuel received at the repository. For this study, the quantity of spent fuel received at the repository will be based on the no-new-orders projection. The no-new-orders projection represents nuclear power plants that are currently operating or are under active construction. The quantity of spent fuel discharged in the no-new-orders projection is 86,050 metric tons of heavy metal (MTHM).

The size of the boreholes applies only to the Vertical Borehole emplacement concept. There are no boreholes excavated in the In-Drift emplacement concept, since disposal containers are placed along side the emplacement drift/room.

Areal power density (APD) refers to the maximum power density allowed per acre (Kilowatts per acre, Kw/acre) and it depends on the heat output of the wastes in the repository. For this study, a maximum average annual APD of 57 Kw/acre will be used for both design concepts. Thermal/mechanical analyses have determined that an APD of 57 Kw/acre results in an acceptable response of the host rock to the effects of the thermal load due to the wastes emplaced underground.

The distance between disposal containers is based on the cumulative long-term heat output of the wastes in the repository. The distance may be varied periodically to take into account the decrease

in age and increase in burnup that will occur as the initial inventory of spent fuel is depleted. This distance will determine the number of disposal containers that can be emplaced in each disposal drift.

The retrievability period refers to the time in which tests are to be conducted to ensure that the repository is performing as expected. During this period wastes may be required to be retrieved on a reasonable schedule starting at any time (up to 50 years in the baseline concept and 100 years in the alternative concept) after waste emplacement operations are initiated.

The attributes for each concept are shown in Table 3-1.

3.3 Methodology

A computer model is used in the calculation repository underground costs (URCOST). URCOST is a LOTUS 1-2-3™ spreadsheet which resides on an IBM personal computer. The underground repository cost (URCOST) spreadsheet is used to calculate the underground development, operating, and closure costs which occur at the repository horizon.

The URCOST model uses annual waste package logistics and corresponding heat ratios, burnup, average spent fuel age, and average metric tons of heavy metal (MTHM) per assembly to calculate costs for the the following activities on an annual basis: total excavation requirements, general maintenance and underground service system activities, construction, and staffing requirements for underground operations.

Table 3-1 Concepts Attributes

| ATTRIBUTE | VERTICAL BOREHOLE CONCEPT | IN-DRIFT CONCEPT |
|---|--|---|
| Number of disposal containers Spent fuel containers: Intact ¹ /Small MPC ² Mixed ¹ /Large MPC ² Defense High-level Waste (DHLW) containers | 5,991 37,930 18,050 | 2,097 9,212 4,513 |
| Size of boreholes Spent Fuel DHLW | 25 ft deep and 31 in diameter 20 ft deep and 29 in diameter | NA NA |
| Areal Power Density (APD) | 57 Kw/acre | 57 Kw/acre |
| Distance between disposal containers Spent fuel DHLW | 15 ft 7.5 ft (between spent fuel containers) | 52 ft 21 ft (between spent fuel containers) |
| Retrievability period | 50 years | 100 years |

¹ The nuclear waste contained in the waste packages is of two forms: intact fuel which is spent fuel from either a boiling water reactor (BWR) or a pressurized water reactor (PWR) or; mixed fuel which is a combination of spent fuel from the two types of reactors.

² There are two sizes of waste packages in the In-Drift emplacement concept: small Multi-Purpose Canister (MPC) and large MPC.

NA=Not Applicable

Cost estimates of underground construction and operation are based on the number of disposal containers and spent fuel logistics. The URCOST model accepts the disposal container quantities and spent fuel logistics, on an annual basis, and uses design specifications and other assumptions to simulate modifications to the reference underground designs.

Design information also identifies other direct inputs and provides unit costs for URCOST in terms of tonnage, development schedules, and excavation requirements for waste emplacement rooms and other required drifts.

3.3.1 Assumptions

The URCOST model uses the following assumptions to calculate costs.

1. The distance between disposal containers constraints are based on the designs for the repository.

The distance between disposal containers assumed for the Vertical Borehole and In-Drift emplacement concepts are 15 feet and 52 feet, respectively.

2. The Vertical Borehole emplacement concept assumes that spent fuel containers are all emplaced vertically in partially lined boreholes. The depth for the spent fuel boreholes is 25 feet. The borehole diameter is 31 inches.

The In-Drift emplacement concept assumes that spent fuel containers are emplaced in the open inside the emplacement drifts. No special boreholes would be constructed to

isolate individual waste containers.

3.3.2 Scope of Cost Element

Six major cost categories make up the underground facility estimate: excavation, excavated material handling, general maintenance, borehole development (Vertical Borehole emplacement concept), emplacement, and underground service systems. These categories are further subdivided into four major phases for estimation: construction, emplacement, caretaker, and closure and decommissioning. These six categories and four phases are described in detail in the paragraphs that follow.

3.3.2.1 Cost Categories

The calculations detailed in Section 3.3.2.4 are used by URCOST to calculate annual costs in the following cost categories.

Excavation - The excavation category includes the costs of all common and emplacement areas.

Excavated Material Handling - The excavated material handling category includes the costs for handling excavated material and backfill.

General Maintenance - The general maintenance category includes the costs for maintenance of underground space to include road grading, trash removal, utility repair, and upkeep of special facilities.

Borehole Development - The borehole development category includes costs for excavation and preparation of emplacement boreholes.

Emplacement - The emplacement category includes costs for underground transport of waste, emplacement of waste, and borehole closure.

Underground Service Systems - The underground service systems categories includes the costs of support systems facilities, utilities, and monitoring.

3.3.2.2 Phases

Construction Phase - This phase includes the costs for excavation and construction of underground support areas and excavation for waste emplacement.

Emplacement Phase - This phase includes costs to cover all staffing, maintenance, supplies, and utilities during waste emplacement.

Caretaker Phase - This phase includes the costs to cover all staffing, maintenance, supplies, and utilities used during the caretaker phase. During this period the underground facility will be monitored and maintained at a level adequate to retrieve waste containers, should it be necessary. The durations of the caretaker phase are 50 years and 100 years for the Vertical Borehole and the In-Drift emplacement concept, respectively.

Closure and Decommissioning Phase - This is the final phase of the underground facility. It includes costs for backfilling and permanently sealing the underground facilities of the repository.

Closure and decommissioning activities begin immediately after the final year of the caretaker phase when the retrievability period is over. The four phases and their duration are shown in Table 3-2.

Table 3-2 Phases of the Underground Facilities

| Phase | Duration | |
|-----------------------------------|---|------------------------------------|
| | Vertical Borehole Emplacement Concept | In-Drift Emplacement Concept |
| Construction Phase | 1997-2009 | 1997-2009 |
| Emplacement Phase | 2010-2045 | 2010-2045 |
| Caretaker Phase | 2046-2059 | 2046-2109 |
| Closure and Decommissioning Phase | 2060-2070 | 2110-2120 |

3.3.2.3 Input Data

Input data for the URCOST model includes both design and cost data used to predict underground facility costs. Design information is provided on Table 3-3. Unit cost data by phase is provided on Table 3-4. As previously mentioned, design and unit cost data were taken directly from cost estimates provided by the project site. URCOST output is presented in Appendix A.

Table 3-3 Design Input Data³

| Design Input | Vertical Borehole Emplacement Concept | In-Drift Emplacement Concept |
|--|--|---------------------------------|
| Mined Rock Quantities | | |
| Common Areas (thousand tons) | 300 | 300 |
| Emplacement Areas (tons/package) | 610 | 2,721 |
| Productivity | | |
| Excavation (tons/man-year) | 3,500 | 3,500 |
| Borehole Development (25' deep, 31" diameter) (holes/man-year) | 30 | NA |
| Emplacement (packages/man-year) | 125 | 125 ⁴ |
| Backfill (tons/man-year) | 37,040 | 37,040 |
| Backfill | | |
| Compaction Factor | 0.76 | 0.76 |
| Fixed Staff | | |
| General Maintenance | 21 | 21 |
| Underground Service System | 239 | 239 |

³ SANDIA, 1990 [Reference 3].

⁴ Due to the lack of data for the Alternative emplacement concept, it was assumed that the emplacement productivity (packages/man-year) is the same as for the Baseline concept. Although the waste containers for the Alternative concept are larger than the waste containers used in the Baseline concept, these containers are placed along the side of the emplacement drift, rather than in a borehole and thus do not require additional precision handling.

NA=Not Applicable

Table 3-4 Cost Input Data⁵
(in 1995 Dollars)

| Cost Input | Construction Phase | | Emplacement Phase | | Caretakeer Phase | | Closure & Decommissioning Phase | |
|---|--------------------|----------|-------------------|----------|-------------------|----------|---------------------------------|----------|
| | Vertical Borehole | In-Drift | Vertical Borehole | In-Drift | Vertical Borehole | In-Drift | Vertical Borehole | In-Drift |
| Excavation (\$/ton) | 32.84 | | 32.84 | | 32.84 | | 32.84 | |
| Excavated Material Hauling (\$/ton) | 7.40 | | 2.99 | | NA | | NA | |
| General Maintenance ⁶ (millions of \$/yr) | 2,259 | 2,485 | 3,825 | 4,208 | 2,220 | 2,442 | 1,895 | 2,085 |
| Underground Services ⁶ (millions of \$/yr) | 20,032 | 22,035 | 29,384 | 32,322 | 5,512 | 6,063 | 10,346 | |
| Support Utilities | 3,151 | 3,466 | 1,956 | 2,152 | 1,417 | 1,559 | 9,348 | |
| Monitoring | 3,180 | 3,498 | 6,241 | 6,865 | 2,621 | 2,883 | 2,102 | |
| Boreholes (\$/borehole) | 9,818.40 | NA | 9,818.40 | NA | NA | NA | NA | NA |
| Spent Nuclear Fuel (SNF) DHLW | 9,644.12 | NA | 9,644.12 | NA | NA | NA | NA | NA |
| Emplacement ⁶ SNF & DHLW (\$/package) | NA | | 6,571 | 7,554 | | | NA | NA |
| Backfill (\$/ton) | NA | | NA | | NA | | NA | 9.66 |

⁵ SANDIA, 1990 (Reference 3).

⁶ The following assumptions were made for the In-Drift emplacement concept due to the lack of data: 10% increase in General Maintenance; 10% increase in Underground Service Systems during the Construction, Emplacement, and Caretakeer phases; 15% increase in emplacement operations. These assumptions are driven by the much larger size of waste packages in the In-Drift emplacement concept.

NA=Not Applicable

3.3.2.4 Calculations

The URCOST spreadsheet follows a calculation sequence to arrive at costs on an annual basis. These costs are then summed to provide total underground repository costs. The calculation consists of the following steps (an example of each calculation is presented for the baseline case, Vertical Borehole Emplacement Concept). Refer to tables 3-3 and 3-4 for design and cost input data.

1. Excavation requirements (tons) are predicted based on the number of waste containers and the corresponding characteristics of the waste in the containers.

Annual fixed tonnage = annual common area tonnage

It was determined in previous studies that the annual fixed tonnage for the common areas is 60,000 tons for years 2005 through 2009 (SANDIA, 1990) [Reference 3].

Annual variable tonnage = (annual number of waste containers)x(tons per waste container)x(mining correction factor)

For the year 2010 for intact and mix fuel (in thousands):

Intact fuel:

(156 pkges to be emplaced in

2013⁸)x(610tons/pkge)x((53.1%x.16) +.84)/1,000)=88tons

Mix fuel:

(306 pkges to be emplaced in

2013⁸)x(610tons/pkge)x((64%x.16) +.84)/1,000)=176tons

Total tons for the year 2010=88+176=264tons

⁷ The number of waste packages is a forecast obtained from a spent fuel logistics model (WESTON, 1988) [Reference 16].

⁸ Emplacement drifts will be prepared three years in advance.

Mining Correction Factor = (heat ratio, fraction of container heat to design heat) or (energy deposition ratio, function of spent fuel age and burnup) or (extraction factor, function of rock mechanics)

2. Costs for excavation are calculated on an annual basis.

Annual excavation cost = (annual fixed tonnage + annual variable tonnage for all waste types)x(fully loaded excavation cost per ton specific to either construction or emplacement operations)

For the year 2010 (in thousands):

$$(0.0 \text{ fixed tonnage} + 264 \text{ tons}) \times (\$32.84/\text{ton, during the emplacement phase}) \\ = \$8,668$$

Note: excavation of common areas ends in the year 2009.

3. Excavated material handling costs are calculated based on the annual excavation requirements.

Annual excavated material handling cost = (annual fixed tonnage + annual variable tonnage)x(fully loaded unit excavated material handling cost per ton specific to either construction or emplacement operations)

For the year 2010 (in thousands):

$$(0.0 \text{ fixed tonnage} + 264 \text{ tons}) \times (\$2.99/\text{ton}) = \$790$$

⁹ Excavated material handling cost per ton during the emplacement phase

4. Annual fixed costs specific to construction, emplacement, caretaker, and closure phases are assigned.

These include costs for general maintenance for each phase (in thousands), see Table 3-4:

Construction Phase = \$2,259

Emplacement Phase = \$3,825

Caretaker Phase = \$2,220

Closure & Decommissioning Phase = \$1,895

5. Emplacement borehole costs = (number of waste containers to be emplaced in the next year)x(waste emplacement borehole unit cost). This category does not apply to the In-Drift alternative since waste containers are stored along the emplacement drifts, rather than in boreholes on the floor of the emplacement drifts.

For the year 2010 (in thousands):

(186⁰ pkgs to be emplaced in 2011¹¹)x(\$9,818.4/pkg)/1,000 = \$1,826

6. Waste transfer and emplacement costs are calculated based on the annual number of waste containers. Additionally, waste container removal costs for performance confirmation activities are assigned.

Annual emplacement/removal cost = (annual number of waste containers

¹⁰ WESTON, 1988 [Reference 16].

¹¹ Boreholes will be prepared one year in advance, since construction of boreholes and emplacement of waste in those boreholes can not occur simultaneously.

emplaced)x(emplacement unit cost per container) + (fixed cost per year by project phase for waste removal, based on project phase)

For the year 2010 (in thousands):

$$\text{Annual emplacement cost} = (207^{10} \text{ pkges}) \times (\$6,571^{12}/\text{pkge}) = \$1,360$$

Annual removal cost is fixed at \$107, however, performance confirmation activities begin in the year 2015. Therefore, removal cost for the year 2010 = \$0.

$$\text{Annual emplacement/removal cost} = \$1,360 + \$0 = \$1,360$$

7. Backfill costs are computed from unit costs and backfill quantities which are estimated based on initial excavation and compaction factors.

Backfill quantity = (sum of all fixed and variable excavation tonnages)x(compaction factor)

Backfill activities begin in 2060 through 2070. For the year 2060 (in thousands):

$$(25,990^{13} \text{ tons}) \times (.76) = 1,796 \text{ tons}$$

¹² Emplacement unit cost per container during the emplacement phase, see Table 3-4.

¹³ WESTON, 1988 [Reference 17].

Annual backfill cost = (backfill quantity)x(unit backfill cost)

For the year 2060 (in thousands):

$$(1,796\text{tons})\times(\$9.66/\text{ton})=\$17,346$$

8. Phase specific annual fixed costs for underground service systems are assigned. These include support facilities, utilities, and monitoring.

These fixed costs are as follows (in thousands):

| | <u>Support Serv. Fac.</u> | <u>Utilities</u> | <u>Monitoring</u> |
|---------------------------|---------------------------|------------------|-------------------|
| <i>Construction Phase</i> | \$20,032 | \$3,151 | \$3,180 |
| <i>Emplmnt. Phase</i> | \$29,384 | \$1,956 | \$6,241 |
| <i>Caretaker Phase</i> | \$5,512 | \$1,417 | \$2,621 |
| <i>Closure Phase</i> | \$10,346 | \$9,348 | \$2,102 |

9. Life cycle costs are summed annually by account and phase. All cost estimates are presented in constant 1995 dollars for ease of comparison and to eliminate the effects of inflation for a project with a duration spanning up to 123 years.
10. Staffing is estimated on an annual basis for each operation conducted underground. Calculations are based on unit operation productivity factors from project designs.

For the year 2010, average daily staffing is as follows:

Excavation:

$$(\text{annual excavated tonnage})\times(1,000)/(\text{tonnage per man-year})$$

$$= (264\text{tons})\times(1,000)/3,500\text{tons per man-year} = 75 \text{ people}$$

General maintenance:

staffing for this activity is fixed at 21 people.

Borehole Development:

(# of pkges to be emplaced in the following year)/(# of boreholes per man-year)

$$= (186 \text{ pkges}) / (30 \text{ boreholes per man-year}) = 6.2 \text{ or } 6 \text{ people}$$

Emplacement:

(total # of pkges to be emplaced in the current year)/(# of pkges emplaced per man-year)

$$= (207 \text{ pkges}) / (125 \text{ pkges per man-year}) = 1.6 \text{ or } 2 \text{ people}$$

Backfill:

(backfill quantity)/(backfill tons per man-year)

$$= 0 / 37,040 = 0 \text{ people because backfill activities begin in 2060.}$$

Underground Services System:

Staffing for these activities is fixed at 239.

11. Total excavation requirements for the Defense High-level Waste (DHLW) are estimated as a percentage of the total excavation tonnage based on the quantity of DHLW containers. The methodology to arrive at the defense portion of the total cost is based on a cost-sharing factor. This methodology is not covered in this report.

The steps described above require input data that details the necessary unit costs and productivity values for each subsurface cost account. Additionally, information detailing common area excavation tonnage, development schedules, and emplacement area tonnage are developed from project

data. Underground facility cost does not include capital equipment. Capital equipment costs are included in the total repository cost as part of surface facilities costs.

3.4 Analysis Approach

This study considers the evaluation and comparison of two waste emplacement alternatives with unequal lives. The life-cycle of the baseline concept is 73 years. For the alternative concept, the life-cycle is 123 years. Table 3-5 shows a comparison of the number of years in each phase for the two alternatives.

For evaluation purposes, the life-cycle cost for each alternative will be calculated using the URCOST model methodology. Since the two alternatives are of unequal lives, comparison will be made by evaluating the life-cycle cost of the alternatives over the same life span. Four cases were determined for evaluating and comparing the two alternatives:

Evaluation

Case 1: Cost for the Vertical Borehole (baseline) emplacement concept (73 years).

Case 2: Cost for the In-Drift (alternative) emplacement concept (123 years).

Comparison

Case 3: Cost for the baseline concept evaluated at 123 years vs. the alternative concept evaluated at 123 years.

Case 4: Cost for the alternative concept evaluated at 73 years vs. the baseline concept evaluated at 73 years.

The life-cycle cost for the cases defined above are presented in Chapter 4.

Table 3-5 Comparison of Alternatives Phase Durations

| Phase | Vertical Borehole Concept (Baseline) | | In-Drift Concept (Alternative) | |
|---------------------------|---|-------------------|---|-------------------|
| | Duration | # of Years | Duration | # of Years |
| Construction | 1997-2009 | 12 | 1997-2009 | 12 |
| Emplacement ¹⁴ | 2010-2045 | 36 | 2010-2045 | 36 |
| Caretaker ⁸ | 2046-2059 | 14 | 2046-2109 | 64 |
| Closure & Decommissioning | 2060-2070 | 11 | 2110-2020 | 11 |
| Total Years | | 73 | | 123 |

¹⁴ Includes retrievability period: 50 years for the baseline concept and 100 years for the alternative concept.

CHAPTER 4

ANALYSIS AND RESULTS

This chapter presents the life-cycle cost results derived from URCOST for each of the cases defined in Chapter 3 and an analysis of the data.

4.0 Results

As previously stated in Chapter 3, the cases are as follows:

Case 1: Cost for the Vertical Borehole (baseline) emplacement concept (73 years).

Case 2: Cost for the In-Drift (alternative) emplacement concept (123 years).

Case 3: Cost for the baseline concept evaluated at 123 years.

Case 4: Cost for the alternative concept evaluated at 73 years.

The cost estimate for the underground facility for each of the cases is summarized by phase. The cost for the Vertical Borehole (baseline) emplacement concept is summarized in Table 4-1. Table 4-2 summarizes the cost for the In-Drift (alternative) emplacement concept. Table 4-3 summarizes the cost for the baseline concept evaluated at 123 years. The cost for the alternative concept evaluated at 73 years is summarized in Table 4-4.

The increase in retrievability period from 50 years in the baseline case to 100 years in the alternative case is acceptable from a technical point of view. As mentioned earlier, during this period waste containers will be retrieved at a reasonable schedule to ensure that the repository is performing as expected. The purpose of the retrievability period is to assure to the public that the CRWMS is safe.

A longer retrievability period reassures the safety of the system.

Table 4-1 Life-Cycle Cost Estimate for the Baseline Concept (Case 1)

Millions of 1995 Constant Dollars

| Phase | Cost Estimate |
|--|----------------------|
| Construction | 247 |
| Emplacement | 3,375 |
| Caretaker | 166 |
| Closure and Decommissioning | 451 |
| Total underground facility cost | 4,240* |

*Column may not add up due to independent rounding.

Table 4-2 Life-Cycle Cost Estimate for the Alternative Concept (Case 2)

Millions of 1995 Constant Dollars

| Phase | Cost Estimate |
|--|----------------------|
| Construction | 263 |
| Emplacement | 2,845 |
| Caretaker | 829 |
| Closure and Decommissioning | 265 |
| Total underground facility cost | 4,203* |

*Column may not add up due to independent rounding.

Table 4-3 Life-Cycle Cost Estimate for the Baseline Concept Evaluated at 123 Years (Case 3)

Millions of 1995 Constant Dollars

| Phase | Cost Estimate |
|--|----------------------|
| Construction | 247 |
| Emplacement | 3,375 |
| Caretaker | 760 |
| Closure and Decommissioning | 451 |
| Total underground facility cost | 4,834* |

*Column may not add up due to independent rounding.

Table 4-2 Life-Cycle Cost Estimate for the Alternative Concept Evaluated at 73 Years (Case 4)

Millions of 1995 Constant Dollars

| Phase | Cost Estimate |
|--|----------------------|
| Construction | 263 |
| Emplacement | 2,845 |
| Caretaker | 181 |
| Closure and Decommissioning | 265 |
| Total underground facility cost | 3,555* |

*Column may not add up due to independent rounding.

4.1 Analysis

The total cost for the underground facilities for Case 1 and Case 2 is \$4,240 million and \$4,203 million, respectively. Figures 4-1 and 4-2 show the percentage allocation by phase and by cost category, respectively, for Cases 1 and 2. The main cost drivers in both cases are the underground service systems and the excavation categories. As mentioned in Chapter 3, the underground service systems category includes the costs of support systems facilities, utilities, and monitoring. The excavation of all common and emplacement areas are included in the excavation category.

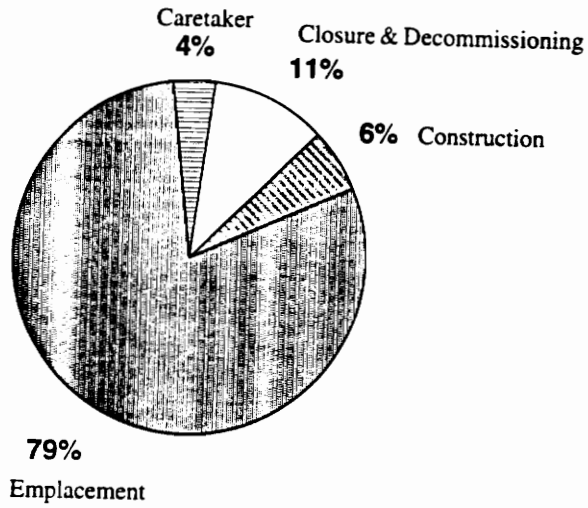
Figures 4-3 and 4-4 show the percentage allocation by phase and by cost category, respectively, for Cases 3 and 4. In all cases, the main cost drivers are the underground service systems and the excavation categories.

4.2 Case 1 versus Case 4

The total cost for the underground facilities for Cases 1 and 4 is \$4,240 million and \$3,555 million, respectively. There is a difference of \$685 million between the two equal-lives cases. The 19% difference accounts for higher costs in the excavated material handling, borehole development, and emplacement categories for Case 1.

- Excavation costs increased by 23% in Case 4 due to the greater amount of earth excavated to accommodate the larger waste containers.
- Excavated material handling costs include removal of the excavated material, and backfill. Material handling costs increased by 22% in Case 4, driven

Cost by Phase



Cost by Cost Category

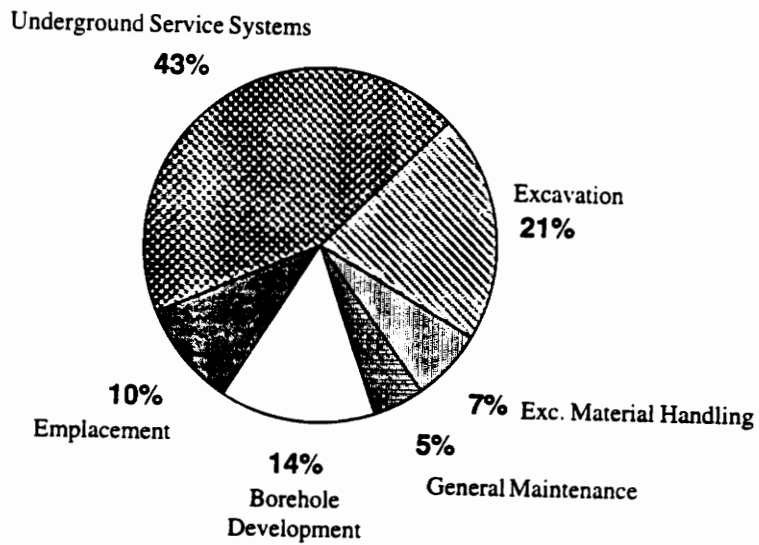
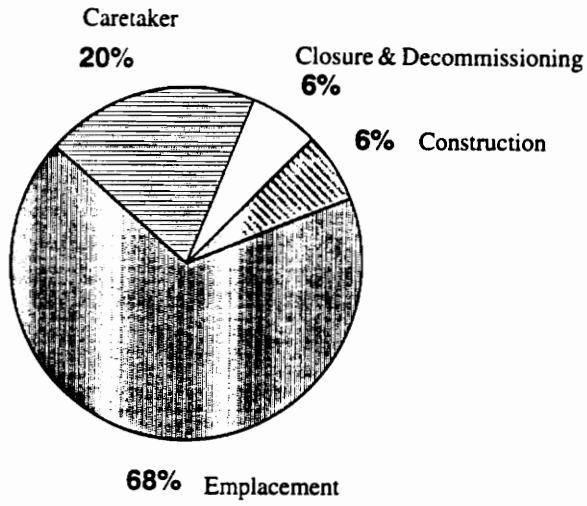


Figure 4-1 - Underground Facility Cost by Phase and Cost Category for the Baseline Concept (Case1)

Cost by Phase



Cost by Cost Category

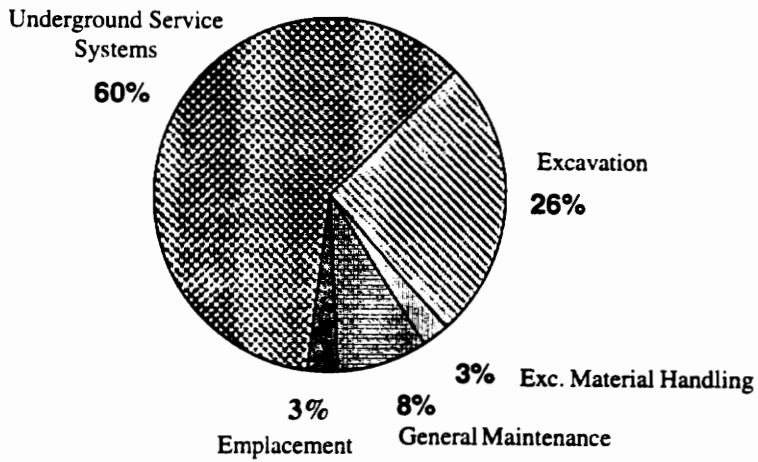
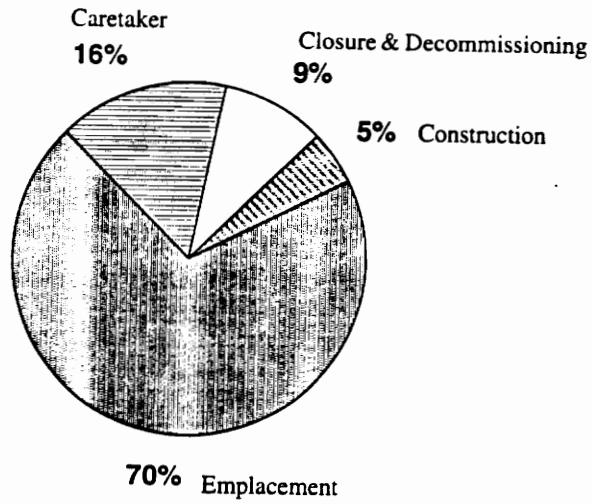


Figure 4-2 - Underground Facility Cost by Phase and Cost Category for the Alternative Concept

(Case 2)

Cost by Phase



Cost by Cost Category

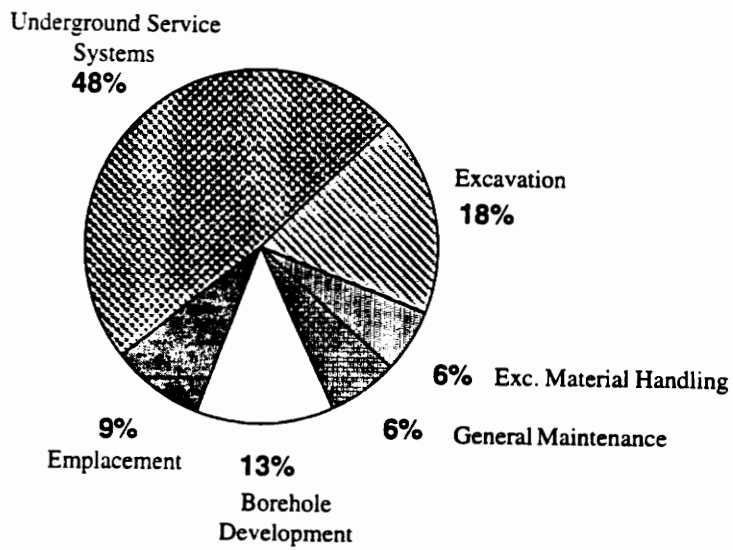
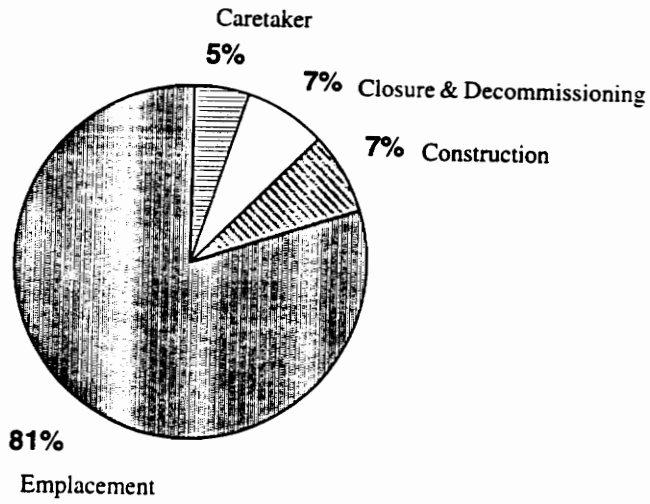


Figure 4-3 - Underground Facility Cost by Phase and Cost Category for the Baseline Concept at 123 Years (Case 3)

Cost by Phase



Cost by Cost Category

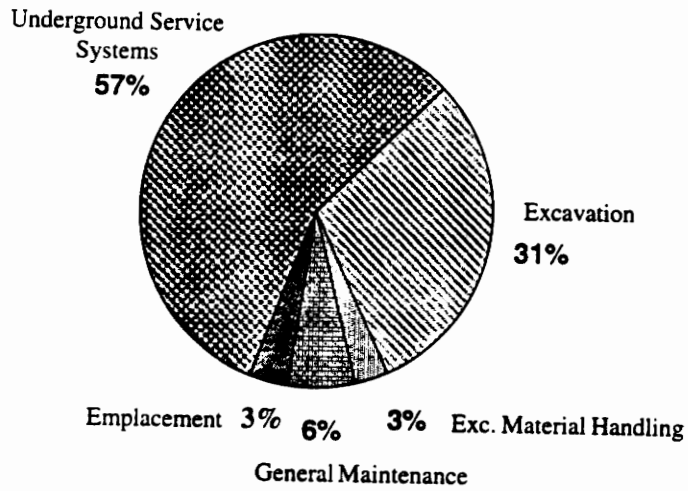


Figure 4-4 - Underground Facility Cost by Phase and Cost Category for the Alternative Concept at 73 Years (Case 4)

by the larger size of waste containers. However, in this case backfilling costs decreased by 98% only the common areas will be backfilled. In Case 1, common and emplacement areas will be backfilled.

- General maintenance costs increased due to the larger size of waste containers in Case 4.
- Borehole development costs decreased by 100% in Case 4 since no boreholes are to be dug.
- Emplacement costs include emplacement and performance confirmation activities. The cost of emplacement activities decreased by 70% in Case 4 due to the lower number of waste containers to be emplaced. Performance confirmation activities consist of removing waste containers for testing. In Case 4, one container is removed for testing every ten years. Case 1 requires the removal of 12 waste containers per year. The lag between performance confirmation activities contributes to an 89% decrease in cost in Case 4. Overall, emplacement costs for Case 4 decrease by 71%.
- Lastly, the underground service systems category include supply systems facilities, utilities, and monitoring. Cost for this category increased by 9% in Case 4.

Overall, the total cost for Case 4 is lower than for Case 1. This may be attributed to the larger size and better quality of waste containers. Although the larger waste containers require more excavation, the savings are manifested in the lower number of waste containers to be emplaced, the smaller area to be backfilled, and the absence of boreholes.

4.3 Case 2 versus Case 3

The total life-cycle cost for the underground facilities for Cases 2 and 3 is \$4,203 million and \$4,834 million, respectively. The difference between Cases 2 and 3 is \$631 million. The 15% difference accounts for higher costs in the excavated material handling, borehole development, and emplacement categories for Case 3. The rationale for cost increases between these two cases is the same as for Cases 1 and 4.

CHAPTER 5

CONCLUSION

This study concentrated in providing an economic evaluation of two nuclear repository underground facility waste emplacement design configurations, a baseline versus an alternative concept as it pertains to commercial spent fuel. Defense costs incurred by the emplacement of defense high-level waste were not within the scope of this study. In the baseline emplacement concept, vertical boreholes will be bored into the floor of the emplacement drifts into which the waste package will be inserted. In the alternative emplacement concept, large multi-barrier (Multi-Purpose Canisters, MPC) waste packages would be placed in the open inside the emplacement drifts. No special boreholes would be constructed to isolate individual waste packages from the travelway inside the emplacement drift.

The criteria used to evaluate the underground facilities emplacement concepts are: number of disposal containers, size of boreholes, Areal Power Density (APD), distance between disposal containers, and retrievability period. The number of disposal containers is dependent on the quantity of spent fuel received at the repository. The quantity of spent fuel received at the repository was based on the no-new-orders projection. The no-new-orders projection represents nuclear power plants that are currently operating or are under construction. The number of spent fuel disposal containers for the baseline and alternative emplacement concepts is 43,921 and 11,309, respectively. The number of DHLW disposal containers is 18,050 and 4,513 for the baseline and alternative emplacement concepts, respectively. The size of boreholes only applies to the baseline concept since disposal containers are placed along side the emplacement drifts in the alternative emplacement concept. The APD refers to the maximum power density allowed per acre (Kilowatt per acre, Kw/acre) and it depends on the heat output of the wastes in the repository. This study used a maximum annual APD of 57 Kw/acre for

both emplacement concepts. The distance between disposal containers determines the number of disposal containers that can be emplaced in each emplacement drift. A distance of 15 and 52 feet for the spent fuel was used for the baseline and alternative emplacement concepts, respectively. The DHLW is placed exactly between spent fuel disposal containers at 7.5 feet in the baseline concept and 21 feet in the alternative concept. Finally, the retrievability period refers to the time in which tests are to be conducted to ensure that the repository is performing as expected. During this period wastes may be required to be retrieved on a reasonable schedule starting any time after waste emplacement operations are initiated. The retrievability period for the baseline and alternative emplacement concepts is 50 and 100 years, respectively.

A computer model was used in the calculation of repository underground facility costs (URCOST). URCOST is a Lotus 1-2-3 spreadsheet used to calculate the underground development, operating, and closure costs which occur at the repository horizon. URCOST uses design specifications and other assumptions to calculate costs on an annual basis for the following cost categories: excavation, excavated material handling, general maintenance, borehole development, emplacement, and underground service systems. Additionally, URCOST summarizes the total cost of underground facilities by phase. These phases include: construction, emplacement, caretaker, and closure and decommissioning. The underground facilities emplacement concepts are of different life span. The life-cycle of the baseline and alternative emplacement concepts is 73 and 123 years, respectively. The defense portion of the total cost is calculated using a cost-sharing factor. Defense costs are estimated as a percentage of the total excavation tonnage based on the quantity of DHLW disposal containers. This methodology was not covered in this report.

Since the two concepts are of unequal lives, a direct comparison could not be made. The study determined four cases to evaluate and compare the two alternatives. Case 1 evaluated the

baseline emplacement concept at its respective life cycle of 73 years. Likewise, Case 2 evaluated the alternative emplacement concept at its respective life cycle of 123 years. For comparison purposes, Case 4 evaluated the baseline concept at 123 years, and Case 4 evaluated the alternative concept at 73 years.

The total cost for Case 1 is \$4,240M, for Case 2 is \$4,203M, for Case 3 is \$4,834M, and for Case 4 is \$3,555M in 1995 constant dollars. The analysis showed that in all cases the main cost drivers were the excavation and the underground service systems categories. When comparing the equal lives cases, the alternative emplacement concept proved to be most favorable by 19% and 15%, respectively, in the 73 and 123 years life-cycles. The difference can be attributed to the larger size and better quality of waste containers. Although the larger waste containers require more excavation, the savings are manifested in the lower number of waste containers to be emplaced, the smaller area to be backfilled, and the absence of boreholes in the alternative emplacement concept. The total cost for the two underground facilities alternatives constitute a management decision number. Based on total cost, the recommended nuclear waste emplacement underground facility configuration is the In-Drift concept. This recommendation is made for the purposes of this report and does not represent any position on the part of the U.S. Department of Energy (DOE).

This analysis was based upon assumptions at the conceptual stage for both emplacement configurations. Future analyses should be conducted as more refined data becomes available. These data will evolve as the project progresses through its life-cycle stages.

CHAPTER 6

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CHAPTER 7

ACRONYMS

| | |
|--------|---|
| APD | Areal Power Density |
| BWR | Boiling-Water Reactor |
| CRWMS | Civilian Radioactive Waste Management System |
| DHLW | Defense High-level waste |
| DOE | Department of Energy |
| HLW | High-level waste |
| MPC | Multi-purpose canister |
| MTHM | Metric tons of heavy metal |
| MRS | Monitored retrievable storage facility |
| NA | Not applicable |
| NRC | Nuclear Regulatory Commission |
| NWPA | Nuclear Waste Policy Act |
| OCRWM | Office of Civilian Radioactive Waste Management |
| PWR | Pressurized water reactor |
| TSLCC | Total system life cycle cost |
| URCOST | Underground cost model |

APPENDIX A
URCOST OUTPUT

CASE 1

UNDERGROUND COST FOR THE BASELINE CONCEPT

| SPREADSHEET INPUT VALUES | | EXCAVATION: | | -Tons- | | -Emplacement Areas- | | -Unit Cost/Ton- | | Const. |
|--------------------------|---------|-------------|----------|-----------|------------|---------------------|----------|-----------------|--|---------|
| -Common Areas | -Year- | Form | Tons/Pkg | Comm Area | Spent Fuel | 610 :DHLW/Hwr. | 0 :Other | 0 | | |
| | 2005 | Intact | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 0 | | \$52.75 |
| | 2006 | Mix | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 0 | | \$52.75 |
| | 2008 | DHLW/Hwr | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 | 0 | | \$52.75 |
| | 2009 | Other | 0 | 0 | 0 | 0 | 0 | 0 | | \$52.75 |
| | 2010 | | | | | | | | | |
| EMPLACEMENT COST/PKG: | | BACKFILL: | | -Comp | | Fact- | | -Unit Cost/Tn- | | |
| -SF Pkgs | \$6,571 | | | | | | | | | \$9.66 |
| -DHLW | \$6,571 | | | | | | | | | |
| -Other | \$0 | | | | | | | | | |

Case 1 Input Values (Cont)

| | | | EXCAVATED MATERIAL HANDLING | GENERAL MAINTENANCE COST | Cost/Ton | Cost/yr (\$600) | BOREHOLE DEVELOPMENT COST |
|------------------|--|--------|-------------------------------------|--------------------------|-----------|-----------------|---------------------------|
| Emplac | | | Unit Cost/Tn | Constr | | | |
| \$32 84 | | \$7 40 | -Const | Emplac | \$0 | \$2 359 | -Unit Cost/Hole |
| \$32 84 | | \$2 99 | -Emplac | -Caretak | \$0 | \$3 925 | Spent Fuel |
| \$32 84 | | \$0 00 | -Closure | -Closure | \$0 | \$2 220 | DHLW |
| | | | | | \$0 | \$1 895 | Other |
| | | | | | | | |
| | | | UNDERGROUND SERVICE SYS(\$600/Year) | | Constr/yr | Emplac | Closure |
| -Backfill Years- | | | -Support System Pac | | \$20 032 | \$29 384 | \$10 346 |
| 2060 | | 2070 | -Utilities | | \$3 151 | \$1 956 | \$0 348 |
| | | | -Monitoring | | \$3 180 | \$6 241 | \$2 192 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Case 1 Input Values (Cont.)

| PRODUCTIVITY FACTORS | Units | Units per Man Year | Fixed Staff/Year | PERFORMANCE CONFIRMATION |
|----------------------|-----------|--------------------|------------------|--------------------------|
| Variable- | | | | |
| -Excav. | Tons | 3500.00 | 0 | |
| -Mat. Hand. | Tons | 0.00 | 0 | |
| -Bore. Dev. | Boreholes | 30.00 | 0 | 107 |
| -Emplac. | Packages | 125.00 | 0 | |
| -Backfill | Tons | 37040.00 | 0 | (000) PER YR |
| Fixed- | | | | |
| -Gen. Maint. | Tons | 0 | 21 | |
| -UG Svc. Sys. | Tons | 0 | 239 | |

| YEAR | WASTE PACKAGE QUANTITIES | | | | EXCAVATION TONNAGE(000) | | | | | | | | | |
|------|--------------------------|------|--------|------|-------------------------|--------|--------------------------------|-------|--------------|--------|-----|--------------------------------|-------|-------|
| | Intact | Mix | Hdwre. | DHLW | Other | Total | Mining Correction Ratio Intact | Mix | Common Areas | Intact | Mix | Emplacement Areas----- DHLW | Other | Total |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 200 | 0 | 0 | 260 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 275 | 0 | 0 | 335 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 15 | 275 | 0 | 0 | 350 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 15 | 275 | 0 | 0 | 350 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 62 | 275 | 0 | 0 | 397 |
| 2010 | 26 | 181 | 0 | 0 | 0 | 207 | 58.6% | 68.0% | 0 | 88 | 176 | 0 | 0 | 264 |
| 2011 | 27 | 159 | 0 | 0 | 0 | 186 | 45.2% | 50.5% | 0 | 75 | 454 | 0 | 0 | 529 |
| 2012 | 111 | 135 | 0 | 0 | 246 | 50.6% | 58.1% | 33 | 33 | 847 | 0 | 0 | 880 | 880 |
| 2013 | 156 | 308 | 0 | 0 | 462 | 53.1% | 64.0% | 95 | 95 | 801 | 0 | 0 | 896 | 896 |
| 2014 | 128 | 782 | 0 | 0 | 910 | 72.9% | 69.6% | 111 | 111 | 800 | 0 | 0 | 911 | 911 |
| 2015 | 57 | 1442 | 0 | 800 | 2,299 | 66.1% | 76.7% | 17 | 881 | 881 | 0 | 0 | 898 | 898 |
| 2016 | 161 | 1350 | 0 | 800 | 2,311 | 80.4% | 82.6% | 165 | 165 | 765 | 0 | 0 | 929 | 929 |
| 2017 | 183 | 1333 | 0 | 800 | 2,316 | 94.4% | 90.0% | 92 | 92 | 836 | 0 | 0 | 929 | 929 |
| 2018 | 28 | 1462 | 0 | 800 | 2,290 | 94.8% | 92.6% | 66 | 66 | 848 | 0 | 0 | 914 | 914 |
| 2019 | 271 | 1260 | 0 | 800 | 2,331 | 97.2% | 96.8% | 61 | 61 | 879 | 0 | 0 | 940 | 940 |
| 2020 | 152 | 1372 | 0 | 800 | 2,324 | 98.5% | 99.5% | 36 | 36 | 878 | 0 | 0 | 914 | 914 |
| 2021 | 108 | 1394 | 0 | 800 | 2,302 | 99.9% | 98.6% | 135 | 135 | 803 | 0 | 0 | 939 | 939 |
| 2022 | 100 | 1442 | 0 | 800 | 2,342 | 102.5% | 99.2% | 124 | 124 | 820 | 0 | 0 | 945 | 945 |
| 2023 | 59 | 1440 | 0 | 800 | 2,299 | 95.9% | 99.8% | 105 | 105 | 845 | 0 | 0 | 950 | 950 |
| 2024 | 220 | 1305 | 0 | 800 | 2,325 | 105.9% | 105.6% | 159 | 159 | 793 | 0 | 0 | 952 | 952 |
| 2025 | 202 | 1328 | 0 | 800 | 2,330 | 106.3% | 107.8% | 9 | 9 | 742 | 0 | 0 | 752 | 752 |
| 2026 | 169 | 1350 | 0 | 800 | 2,319 | 110.8% | 116.4% | 59 | 59 | 708 | 0 | 0 | 765 | 765 |
| 2027 | 252 | 1259 | 0 | 800 | 2,311 | 123.0% | 120.3% | 168 | 168 | 600 | 0 | 0 | 768 | 768 |
| 2028 | 15 | 1491 | 0 | 800 | 2,306 | 123.7% | 122.5% | 123 | 123 | 628 | 0 | 0 | 751 | 751 |
| 2029 | 92 | 1432 | 0 | 800 | 2,324 | 127.7% | 123.5% | 443 | 443 | 383 | 0 | 0 | 826 | 826 |
| 2030 | 268 | 1265 | 0 | 800 | 2,333 | 118.2% | 122.8% | 281 | 281 | 548 | 0 | 0 | 829 | 829 |
| 2031 | 194 | 1313 | 0 | 800 | 2,307 | 124.9% | 121.5% | 122 | 122 | 782 | 0 | 0 | 903 | 903 |
| 2032 | 694 | 911 | 0 | 800 | 2,405 | 129.7% | 130.5% | 10 | 10 | 977 | 0 | 0 | 987 | 987 |
| 2033 | 436 | 1159 | 0 | 800 | 2,395 | 135.6% | 135.9% | 57 | 57 | 921 | 0 | 0 | 978 | 978 |
| 2034 | 190 | 1372 | 0 | 800 | 2,362 | 131.1% | 133.5% | 77 | 77 | 887 | 0 | 0 | 964 | 964 |
| 2035 | 15 | 1526 | 0 | 800 | 2,341 | 127.2% | 131.0% | 84 | 84 | 885 | 0 | 0 | 969 | 969 |
| 2036 | 91 | 1449 | 0 | 800 | 2,340 | 113.6% | 126.1% | 202 | 202 | 763 | 0 | 0 | 966 | 966 |
| 2037 | 124 | 1383 | 0 | 304 | 1,811 | 113.0% | 131.8% | 62 | 62 | 450 | 0 | 0 | 511 | 511 |
| 2038 | 136 | 1398 | 0 | 146 | 1,680 | 109.8% | 123.6% | 87 | 87 | 1 | 0 | 0 | 88 | 88 |
| 2039 | 320 | 1187 | 0 | 0 | 1,507 | 122.9% | 133.8% | 5 | 5 | (0) | 0 | 0 | 5 | 5 |
| 2040 | 96 | 1410 | 0 | 0 | 1,506 | 132.3% | 137.6% | 125 | 125 | (1) | 0 | 0 | 124 | 124 |
| 2041 | 142 | 287 | 0 | 0 | 429 | 103.5% | 123.7% | 22 | 22 | (0) | 0 | 0 | 124 | 124 |

Case 1

| | | | | | | | | | | | | | | | | | | | | |
|------|-------|--------|---|--------|---|--------|-----|--------|--------|--------|--------|---|---|---|---|---|---|---|---|---|
| 2042 | 9 | 385 | 0 | 0 | 0 | 0 | 0 | 394 | 97.6% | 115.5% | 302 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2043 | 205 | 208 | 0 | 0 | 0 | 0 | 413 | 100.3% | 110.7% | 302 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2044 | 35 | 369 | 0 | 0 | 0 | 0 | 404 | 110.4% | 124.2% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2045 | 519 | 85 | 0 | 0 | 0 | 0 | 604 | 71.3% | 109.3% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2046 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2048 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2049 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2050 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2051 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2052 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2053 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2054 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2055 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2056 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2057 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2058 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2059 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2060 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2061 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2062 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2063 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2064 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2066 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2067 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2068 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2069 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2070 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2071 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2072 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2073 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2074 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2075 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2076 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2077 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2078 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2079 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2080 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2081 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2082 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5,991 | 37,930 | 0 | 18,050 | 0 | 61,971 | 300 | 3,693 | 21,996 | 0 | 25,990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| YEAR | EXCAVATION COST(\$000) | | DHLW Areas | Other | TOTAL EXCAVATION COST | EXCAVATED MATERIAL HAND COST (\$000) | GENERAL MAINTENANCE COST (\$000) | | GENERAL MAINTENANCE | | C&D PHASE | |
|------|------------------------|------------------|------------|-------|-----------------------|--------------------------------------|----------------------------------|---------------|---------------------|---------------|-----------|---------------|
| | Common Areas | Spent Fuel Areas | | | | | CNSTRCT PHASE | EMPLCMT PHASE | CNSTRCT PHASE | EMPLCMT PHASE | | CARETKR PHASE |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 |
| 2005 | \$3,165 | \$10,551 | \$0 | \$0 | \$13,716 | \$13,716 | \$1,924 | \$0 | \$0 | \$0 | 0 | 0 |
| 2006 | \$3,165 | \$14,507 | \$0 | \$0 | \$17,673 | \$2,479 | \$2,259 | \$2,259 | \$0 | \$0 | 0 | 0 |
| 2007 | \$3,165 | \$15,289 | \$0 | \$0 | \$18,454 | \$2,589 | \$2,589 | \$2,259 | \$0 | \$0 | 0 | 0 |
| 2008 | \$3,165 | \$15,300 | \$0 | \$0 | \$18,465 | \$2,590 | \$2,590 | \$2,259 | \$0 | \$0 | 0 | 0 |
| 2009 | \$3,165 | \$17,797 | \$0 | \$0 | \$20,962 | \$2,941 | \$2,941 | \$2,259 | \$0 | \$0 | 0 | 0 |
| 2010 | \$0 | \$8,668 | \$0 | \$0 | \$8,668 | \$790 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2011 | \$0 | \$17,357 | \$0 | \$0 | \$17,357 | \$1,583 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2012 | \$0 | \$28,892 | \$0 | \$0 | \$28,892 | \$2,634 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2013 | \$0 | \$29,419 | \$0 | \$0 | \$29,419 | \$2,682 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2014 | \$0 | \$29,912 | \$0 | \$0 | \$29,912 | \$2,727 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2015 | \$0 | \$29,497 | \$0 | \$0 | \$29,497 | \$2,690 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2016 | \$0 | \$30,517 | \$0 | \$0 | \$30,517 | \$2,783 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2017 | \$0 | \$30,503 | \$0 | \$0 | \$30,503 | \$2,781 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2018 | \$0 | \$30,029 | \$0 | \$0 | \$30,029 | \$2,738 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2019 | \$0 | \$30,864 | \$0 | \$0 | \$30,864 | \$2,814 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2020 | \$0 | \$30,012 | \$0 | \$0 | \$30,012 | \$2,737 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2021 | \$0 | \$30,828 | \$0 | \$0 | \$30,828 | \$2,811 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2022 | \$0 | \$31,027 | \$0 | \$0 | \$31,027 | \$2,829 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2023 | \$0 | \$31,199 | \$0 | \$0 | \$31,199 | \$2,845 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2024 | \$0 | \$31,274 | \$0 | \$0 | \$31,274 | \$2,852 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2025 | \$0 | \$24,689 | \$0 | \$0 | \$24,689 | \$2,251 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2026 | \$0 | \$25,122 | \$0 | \$0 | \$25,122 | \$2,291 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2027 | \$0 | \$25,223 | \$0 | \$0 | \$25,223 | \$2,300 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2028 | \$0 | \$24,680 | \$0 | \$0 | \$24,680 | \$2,250 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2029 | \$0 | \$27,136 | \$0 | \$0 | \$27,136 | \$2,474 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2030 | \$0 | \$27,218 | \$0 | \$0 | \$27,218 | \$2,482 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2031 | \$0 | \$29,673 | \$0 | \$0 | \$29,673 | \$2,706 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2032 | \$0 | \$32,404 | \$0 | \$0 | \$32,404 | \$2,955 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2033 | \$0 | \$32,104 | \$0 | \$0 | \$32,104 | \$2,927 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2034 | \$0 | \$31,651 | \$0 | \$0 | \$31,651 | \$2,886 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2035 | \$0 | \$31,834 | \$0 | \$0 | \$31,834 | \$2,903 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2036 | \$0 | \$31,714 | \$0 | \$0 | \$31,714 | \$2,892 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2037 | \$0 | \$16,798 | \$0 | \$0 | \$16,798 | \$1,532 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2038 | \$0 | \$2,884 | \$0 | \$0 | \$2,884 | \$263 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2039 | \$0 | \$168 | \$0 | \$0 | \$168 | \$15 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2040 | \$0 | \$4,077 | \$0 | \$0 | \$4,077 | \$372 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2041 | \$0 | \$706 | \$0 | \$0 | \$706 | \$64 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2042 | \$0 | \$9,908 | \$0 | \$0 | \$9,908 | \$903 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2043 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2044 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | \$0 | \$0 | 3825 | 0 |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | \$0 | \$0 | 0 | 2220 |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | \$0 | \$0 | 0 | 2220 |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | \$0 | \$0 | 0 | 2220 |
| 2050 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | \$0 | \$0 | 0 | 2220 |

| YEAR | BOREHOLE DEV. COST (\$000) | | | | EMPLACEMENT COST(\$000) | | | | BACKFILL-DEV AREAS | | | | | |
|------|----------------------------|----------|-------|----------|-------------------------|---------------|----------|----------|----------------------|----------------|---------------|----------|------------|--------------|
| | SF Pigs | DHLW | Other | Total | CNSTRCT PHASE | EMPLCMN PHASE | SF Pigs | DHLW/Hdw | Confirmation Removal | EMPLCMNT PHASE | CARETKR PHASE | Total | Tons (000) | COST (\$000) |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2005 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2006 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2007 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2008 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2009 | \$2,032 | \$0 | \$0 | \$2,032 | \$2,032 | 0 | 0 | \$0 | \$0 | 0 | 0 | \$0 | 0 | \$0 |
| 2010 | \$1,826 | \$0 | \$0 | \$1,826 | \$0 | 1826 | \$1,360 | \$5,257 | \$107 | 107 | 0 | \$1,360 | 0 | \$0 |
| 2011 | \$2,415 | \$0 | \$0 | \$2,415 | \$0 | 2415 | \$1,222 | \$5,257 | \$107 | 107 | 0 | \$1,222 | 0 | \$0 |
| 2012 | \$4,536 | \$0 | \$0 | \$4,536 | \$0 | 4536 | \$1,616 | \$5,257 | \$107 | 107 | 0 | \$1,616 | 0 | \$0 |
| 2013 | \$8,935 | \$0 | \$0 | \$8,935 | \$0 | 8935 | \$3,036 | \$5,257 | \$107 | 107 | 0 | \$3,036 | 0 | \$0 |
| 2014 | \$14,718 | \$7,715 | \$0 | \$22,433 | \$0 | 22433 | \$5,980 | \$5,257 | \$107 | 107 | 0 | \$5,980 | 0 | \$0 |
| 2015 | \$14,896 | \$7,715 | \$0 | \$22,611 | \$0 | 22611 | \$9,850 | \$5,257 | \$107 | 107 | 0 | \$15,213 | 0 | \$0 |
| 2016 | \$14,885 | \$7,715 | \$0 | \$22,600 | \$0 | 22600 | \$9,929 | \$5,257 | \$107 | 107 | 0 | \$15,292 | 0 | \$0 |
| 2017 | \$14,629 | \$7,715 | \$0 | \$22,345 | \$0 | 22345 | \$9,962 | \$5,257 | \$107 | 107 | 0 | \$15,325 | 0 | \$0 |
| 2018 | \$15,032 | \$7,715 | \$0 | \$22,747 | \$0 | 22747 | \$8,781 | \$5,257 | \$107 | 107 | 0 | \$15,154 | 0 | \$0 |
| 2019 | \$14,963 | \$7,715 | \$0 | \$22,679 | \$0 | 22679 | \$10,060 | \$5,257 | \$107 | 107 | 0 | \$15,424 | 0 | \$0 |
| 2020 | \$14,747 | \$7,715 | \$0 | \$22,463 | \$0 | 22463 | \$10,014 | \$5,257 | \$107 | 107 | 0 | \$15,378 | 0 | \$0 |
| 2021 | \$15,140 | \$7,715 | \$0 | \$22,855 | \$0 | 22855 | \$9,870 | \$5,257 | \$107 | 107 | 0 | \$15,233 | 0 | \$0 |
| 2022 | \$14,718 | \$7,715 | \$0 | \$22,433 | \$0 | 22433 | \$10,132 | \$5,257 | \$107 | 107 | 0 | \$15,496 | 0 | \$0 |
| 2023 | \$14,973 | \$7,715 | \$0 | \$22,688 | \$0 | 22688 | \$9,850 | \$5,257 | \$107 | 107 | 0 | \$15,213 | 0 | \$0 |
| 2024 | \$15,022 | \$7,715 | \$0 | \$22,737 | \$0 | 22737 | \$10,021 | \$5,257 | \$107 | 107 | 0 | \$15,384 | 0 | \$0 |
| 2025 | \$14,914 | \$7,715 | \$0 | \$22,629 | \$0 | 22629 | \$10,054 | \$5,257 | \$107 | 107 | 0 | \$15,417 | 0 | \$0 |
| 2026 | \$14,896 | \$7,715 | \$0 | \$22,611 | \$0 | 22611 | \$9,981 | \$5,257 | \$107 | 107 | 0 | \$15,345 | 0 | \$0 |
| 2027 | \$14,787 | \$7,715 | \$0 | \$22,502 | \$0 | 22502 | \$9,929 | \$5,257 | \$107 | 107 | 0 | \$15,292 | 0 | \$0 |
| 2028 | \$14,963 | \$7,715 | \$0 | \$22,679 | \$0 | 22679 | \$9,896 | \$5,257 | \$107 | 107 | 0 | \$15,259 | 0 | \$0 |
| 2029 | \$15,052 | \$7,715 | \$0 | \$22,767 | \$0 | 22767 | \$10,014 | \$5,257 | \$107 | 107 | 0 | \$15,378 | 0 | \$0 |
| 2030 | \$14,796 | \$7,715 | \$0 | \$22,512 | \$0 | 22512 | \$10,073 | \$5,257 | \$107 | 107 | 0 | \$15,437 | 0 | \$0 |
| 2031 | \$15,759 | \$7,715 | \$0 | \$23,474 | \$0 | 23474 | \$9,902 | \$5,257 | \$107 | 107 | 0 | \$15,266 | 0 | \$0 |
| 2032 | \$15,660 | \$7,715 | \$0 | \$23,376 | \$0 | 23376 | \$10,546 | \$5,257 | \$107 | 107 | 0 | \$15,910 | 0 | \$0 |
| 2033 | \$15,336 | \$7,715 | \$0 | \$23,052 | \$0 | 23052 | \$10,481 | \$5,257 | \$107 | 107 | 0 | \$15,844 | 0 | \$0 |
| 2034 | \$15,130 | \$7,715 | \$0 | \$22,845 | \$0 | 22845 | \$10,264 | \$5,257 | \$107 | 107 | 0 | \$15,627 | 0 | \$0 |
| 2035 | \$15,120 | \$7,715 | \$0 | \$22,836 | \$0 | 22836 | \$10,126 | \$5,257 | \$107 | 107 | 0 | \$15,489 | 0 | \$0 |
| 2036 | \$14,796 | \$2,932 | \$0 | \$17,728 | \$0 | 17728 | \$10,119 | \$5,257 | \$107 | 107 | 0 | \$15,483 | 0 | \$0 |
| 2037 | \$15,061 | \$1,408 | \$0 | \$16,469 | \$0 | 16469 | \$9,902 | \$1,998 | \$107 | 107 | 0 | \$12,007 | 0 | \$0 |
| 2038 | \$14,796 | \$14,796 | \$0 | \$14,796 | \$0 | 14796 | \$10,080 | \$959 | \$107 | 107 | 0 | \$11,146 | 0 | \$0 |
| 2039 | \$14,787 | \$0 | \$0 | \$14,787 | \$0 | 14787 | \$9,902 | \$0 | \$107 | 107 | 0 | \$10,009 | 0 | \$0 |
| 2040 | \$4,212 | \$0 | \$0 | \$4,212 | \$0 | 4212 | \$9,896 | \$0 | \$107 | 107 | 0 | \$10,003 | 0 | \$0 |
| 2041 | \$3,868 | \$0 | \$0 | \$3,868 | \$0 | 3868 | \$2,819 | \$0 | \$107 | 107 | 0 | \$2,926 | 0 | \$0 |
| 2042 | \$4,055 | \$0 | \$0 | \$4,055 | \$0 | 4055 | \$2,569 | \$0 | \$107 | 107 | 0 | \$2,696 | 0 | \$0 |
| 2043 | \$3,967 | \$0 | \$0 | \$3,967 | \$0 | 3967 | \$2,714 | \$0 | \$107 | 107 | 0 | \$2,821 | 0 | \$0 |
| 2044 | \$5,930 | \$0 | \$0 | \$5,930 | \$0 | 5930 | \$2,655 | \$0 | \$107 | 107 | 0 | \$2,761 | 0 | \$0 |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$3,969 | \$0 | \$107 | 107 | 0 | \$4,076 | 0 | \$0 |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | \$107 | 0 | 107 | \$107 | 0 | \$0 |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | \$107 | 0 | 107 | \$107 | 0 | \$0 |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | \$107 | 0 | 107 | \$107 | 0 | \$0 |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | \$107 | 0 | 107 | \$107 | 0 | \$0 |

UNDERGROUND SERVICE SYSTEMS COST

| YEAR | Support Sys. Pac. | C&D PHASE | EMPLMNT PHASE | CARETRK PHASE | C&D PHASE | UTILITIES | CNSTRCT PHASE | EMPLMNT PHASE | CARETRK PHASE | C&D PHASE | Monitoring | CNSTRCT PHASE | EMPLMNT PHASE | CARETRK PHASE | C&D PHASE | Total Svc. Syst. Cost |
|------|----------------------|--------------|------------------|------------------|--------------|-----------|------------------|------------------|------------------|--------------|------------|------------------|------------------|------------------|--------------|-----------------------------|
| | | | | | | | | | | | | | | | | |
| 1997 | \$0 | | | | | | | | | | | | | | | \$0 |
| 1998 | \$0 | | | | | | | | | | | | | | | \$0 |
| 1999 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2000 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2001 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2002 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2003 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2004 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2005 | \$20,032 | | | | | | | | | | | | | | | \$20,364 |
| 2006 | \$20,032 | | | | | | | | | | | | | | | \$20,364 |
| 2007 | \$20,032 | | | | | | | | | | | | | | | \$20,364 |
| 2008 | \$20,032 | | | | | | | | | | | | | | | \$20,364 |
| 2009 | \$20,032 | | | | | | | | | | | | | | | \$20,364 |
| 2010 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2011 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2012 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2013 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2014 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2015 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2016 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2017 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2018 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2019 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2020 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2021 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2022 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2023 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2024 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2025 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2026 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2027 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2028 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2029 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2030 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2031 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2032 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2033 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2034 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2035 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2036 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2037 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2038 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2039 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2040 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2041 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2042 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2043 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2044 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2045 | \$29,364 | | | | | | | | | | | | | | | \$37,581 |
| 2046 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2047 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2048 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2049 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2050 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2051 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2052 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2053 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2054 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2055 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2056 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2057 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2058 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2059 | \$5,512 | | | | | | | | | | | | | | | \$9,549 |
| 2060 | \$10,346 | | | | | | | | | | | | | | | \$21,706 |
| 2061 | \$10,346 | | | | | | | | | | | | | | | \$21,706 |
| 2062 | \$10,346 | | | | | | | | | | | | | | | \$21,706 |

Case 1

| | | | | | | | | | | | | | | | | |
|------|-------------|-----------|-------------|----------|-----------|-----------|----------|----------|----------|-----------|-----------|----------|-----------|----------|----------|-------------|
| 2063 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2064 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2065 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2066 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2067 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2068 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2069 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2070 | \$10,348 | \$0 | 0 | 0 | 10348 | \$9,348 | \$0 | 0 | 0 | 9348 | \$2,102 | \$0 | 0 | 0 | 2102 | \$21,796 |
| 2071 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2072 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2073 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2074 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2075 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2076 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2077 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2078 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2079 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2080 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2081 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| 2082 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 | \$0 | 0 | 0 | 0 | \$0 |
| | \$1,348,949 | \$100,162 | \$1,057,816 | \$77,164 | \$113,808 | \$208,845 | \$15,756 | \$70,426 | \$19,837 | \$102,827 | \$300,387 | \$15,800 | \$224,874 | \$36,687 | \$23,126 | \$1,656,162 |

Case 1

| YEAR | TOTAL COST | | Total Cost in Millions | | | | | TOTAL COST | | | | | |
|------|------------|----------|------------------------------|------------------|-------------------|------------------|--------------|------------|--------|--|--|--|--|
| | (\$000) | | ----- | CNSTRCT PHASE | EMPLCMNT PHASE | CARETKR PHASE | C&D PHASE | | | | | | |
| 1997 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 1998 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 1999 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 2000 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 2001 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 2002 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 2003 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 2004 | \$0 | \$0.00 | | | \$0 | | | | | | | | |
| 2005 | \$44,263 | \$44.26 | | | \$44,263 | | | | | | | | |
| 2006 | \$48,775 | \$48.77 | | | \$48,775 | | | | | | | | |
| 2007 | \$49,666 | \$49.67 | | | \$49,666 | | | | | | | | |
| 2008 | \$49,679 | \$49.68 | | | \$49,679 | | | | | | | | |
| 2009 | \$54,559 | \$54.56 | | | \$54,559 | | | | | | | | |
| 2010 | \$54,051 | \$54.05 | | | \$0 | | | | 54051 | | | | |
| 2011 | \$63,984 | \$63.98 | | | \$0 | | | | 63984 | | | | |
| 2012 | \$79,086 | \$79.09 | | | \$0 | | | | 79086 | | | | |
| 2013 | \$85,478 | \$85.48 | | | \$0 | | | | 85478 | | | | |
| 2014 | \$102,458 | \$102.46 | | | \$0 | | | | 102458 | | | | |
| 2015 | \$111,358 | \$111.36 | | | \$0 | | | | 111358 | | | | |
| 2016 | \$112,598 | \$112.60 | | | \$0 | | | | 112598 | | | | |
| 2017 | \$112,361 | \$112.36 | | | \$0 | | | | 112361 | | | | |
| 2018 | \$112,075 | \$112.07 | | | \$0 | | | | 112075 | | | | |

Case 1

| | | | | | | |
|------|-----------|----------|-----|--------|---|---|
| 2019 | \$113,187 | \$113.19 | \$0 | 113187 | 0 | 0 |
| 2020 | \$111,995 | \$112.00 | \$0 | 111995 | 0 | 0 |
| 2021 | \$113,134 | \$113.13 | \$0 | 113134 | 0 | 0 |
| 2022 | \$113,192 | \$113.19 | \$0 | 113192 | 0 | 0 |
| 2023 | \$113,352 | \$113.35 | \$0 | 113352 | 0 | 0 |
| 2024 | \$113,654 | \$113.65 | \$0 | 113654 | 0 | 0 |
| 2025 | \$106,393 | \$106.39 | \$0 | 106393 | 0 | 0 |
| 2026 | \$106,715 | \$106.72 | \$0 | 106715 | 0 | 0 |
| 2027 | \$106,724 | \$106.72 | \$0 | 106724 | 0 | 0 |
| 2028 | \$106,275 | \$106.27 | \$0 | 106275 | 0 | 0 |
| 2029 | \$109,162 | \$109.16 | \$0 | 109162 | 0 | 0 |
| 2030 | \$109,054 | \$109.05 | \$0 | 109054 | 0 | 0 |
| 2031 | \$112,525 | \$112.52 | \$0 | 112525 | 0 | 0 |
| 2032 | \$116,050 | \$116.05 | \$0 | 116050 | 0 | 0 |
| 2033 | \$115,333 | \$115.33 | \$0 | 115333 | 0 | 0 |
| 2034 | \$114,416 | \$114.42 | \$0 | 114416 | 0 | 0 |
| 2035 | \$114,468 | \$114.47 | \$0 | 114468 | 0 | 0 |
| 2036 | \$109,223 | \$109.22 | \$0 | 109223 | 0 | 0 |
| 2037 | \$88,212 | \$88.21 | \$0 | 88212 | 0 | 0 |
| 2038 | \$70,496 | \$70.50 | \$0 | 70496 | 0 | 0 |
| 2039 | \$66,386 | \$66.39 | \$0 | 66386 | 0 | 0 |
| 2040 | \$60,070 | \$60.07 | \$0 | 60070 | 0 | 0 |
| 2041 | \$48,971 | \$48.97 | \$0 | 48971 | 0 | 0 |
| 2042 | \$58,968 | \$58.97 | \$0 | 58968 | 0 | 0 |
| 2043 | \$48,194 | \$48.19 | \$0 | 48194 | 0 | 0 |
| 2044 | \$50,098 | \$50.10 | \$0 | 50098 | 0 | 0 |
| 2045 | \$45,482 | \$45.48 | \$0 | 45482 | 0 | 0 |

Case 1

| | | | | | | |
|------|----------|---------|-----|---|-------|-------|
| 2046 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2047 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2048 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2049 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2050 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2051 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2052 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2053 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2054 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2055 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2056 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2057 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2058 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2059 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2060 | \$41,035 | \$41.04 | \$0 | 0 | 11876 | 0 |
| 2061 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2062 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2063 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2064 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2065 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2066 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2067 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2068 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2069 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2070 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2071 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2072 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 |

Case 1

| | | | | | | | |
|------|--------------------|-------------------|------------------|--------------------|------------------|------------------|---|
| 2073 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2074 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2075 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2076 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2077 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2078 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2079 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2080 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2081 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2082 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| | \$4,239,774 | \$4,239.77 | \$246,941 | \$3,375,180 | \$166,266 | \$451,387 | |

Case 1

AVERAGE DAILY STAFFING

| YEAR | Excav. | Excav. Mat.Hand. | Gen. Maint. | Borehole Develop. | Emplacem | Backfill | UG Svc. Sys. | TOTAL |
|------|--------|------------------|-------------|-------------------|----------|----------|--------------|-------|
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 74 | 0 | 21 | 0 | 0 | 0 | 239 | 334 |
| 2006 | 96 | 0 | 21 | 0 | 0 | 0 | 239 | 356 |
| 2007 | 100 | 0 | 21 | 0 | 0 | 0 | 239 | 360 |
| 2008 | 100 | 0 | 21 | 0 | 0 | 0 | 239 | 360 |
| 2009 | 114 | 0 | 21 | 7 | 0 | 0 | 239 | 380 |
| 2010 | 75 | 0 | 21 | 6 | 2 | 0 | 239 | 343 |
| 2011 | 151 | 0 | 21 | 8 | 1 | 0 | 239 | 421 |
| 2012 | 251 | 0 | 21 | 15 | 2 | 0 | 239 | 529 |
| 2013 | 256 | 0 | 21 | 30 | 4 | 0 | 239 | 550 |
| 2014 | 260 | 0 | 21 | 77 | 7 | 0 | 239 | 604 |
| 2015 | 257 | 0 | 21 | 77 | 18 | 0 | 239 | 612 |
| 2016 | 265 | 0 | 21 | 77 | 18 | 0 | 239 | 621 |
| 2017 | 265 | 0 | 21 | 76 | 19 | 0 | 239 | 620 |

Case 1

| | | | | | | | | |
|------|-----|---|----|----|----|---|-----|-----|
| 2018 | 261 | 0 | 21 | 78 | 18 | 0 | 239 | 617 |
| 2019 | 269 | 0 | 21 | 77 | 19 | 0 | 239 | 625 |
| 2020 | 261 | 0 | 21 | 77 | 19 | 0 | 239 | 616 |
| 2021 | 268 | 0 | 21 | 78 | 18 | 0 | 239 | 625 |
| 2022 | 270 | 0 | 21 | 77 | 19 | 0 | 239 | 625 |
| 2023 | 271 | 0 | 21 | 78 | 18 | 0 | 239 | 627 |
| 2024 | 272 | 0 | 21 | 78 | 19 | 0 | 239 | 628 |
| 2025 | 215 | 0 | 21 | 77 | 19 | 0 | 239 | 571 |
| 2026 | 219 | 0 | 21 | 77 | 19 | 0 | 239 | 574 |
| 2027 | 219 | 0 | 21 | 77 | 18 | 0 | 239 | 575 |
| 2028 | 215 | 0 | 21 | 77 | 18 | 0 | 239 | 571 |
| 2029 | 236 | 0 | 21 | 78 | 19 | 0 | 239 | 592 |
| 2030 | 237 | 0 | 21 | 77 | 19 | 0 | 239 | 592 |
| 2031 | 258 | 0 | 21 | 80 | 18 | 0 | 239 | 617 |
| 2032 | 282 | 0 | 21 | 80 | 19 | 0 | 239 | 641 |
| 2033 | 279 | 0 | 21 | 79 | 19 | 0 | 239 | 637 |
| 2034 | 275 | 0 | 21 | 78 | 19 | 0 | 239 | 632 |
| 2035 | 277 | 0 | 21 | 78 | 19 | 0 | 239 | 634 |
| 2036 | 276 | 0 | 21 | 60 | 19 | 0 | 239 | 615 |
| 2037 | 146 | 0 | 21 | 56 | 14 | 0 | 239 | 477 |
| 2038 | 25 | 0 | 21 | 50 | 13 | 0 | 239 | 349 |
| 2039 | 1 | 0 | 21 | 50 | 12 | 0 | 239 | 324 |
| 2040 | 35 | 0 | 21 | 14 | 12 | 0 | 239 | 322 |
| 2041 | 6 | 0 | 21 | 13 | 3 | 0 | 239 | 283 |
| 2042 | 86 | 0 | 21 | 14 | 3 | 0 | 239 | 363 |
| 2043 | 0 | 0 | 21 | 13 | 3 | 0 | 239 | 277 |
| 2044 | 0 | 0 | 21 | 20 | 3 | 0 | 239 | 283 |

Case 1

| | | | | | | | | | | | | |
|------|------|---|------|------|-----|-----|-------|-------|---|---|---|---|
| 2072 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2073 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2074 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2075 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2076 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2077 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2078 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2079 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2080 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2081 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2082 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7426 | 0 | 1386 | 2066 | 496 | 533 | 10583 | 22489 | | | | |

Case 1

| Project Phase | TOTAL COST |
|---------------|--------------------|
| -Construction | \$246,941 |
| -Emplacement | \$3,375,180 |
| -Caretaker | \$166,266 |
| -Closure | \$451,387 |
| | ----- |
| | \$4,239,774 |

CASE 2

UNDERGROUND COST FOR THE ALTERNATIVE CONCEPT

| SPREADSHEET INPUT VALUES | EXCAVATION: -Common Areas | -Year- | -Tons- | -Emplacement Areas- | | -Unit Cost/Ton- | |
|--------------------------------|------------------------------|---------|--------|---------------------|-----------|-----------------|---------|
| | | | | Form | Tons/Pkg. | Comm. Area | Const. |
| | 2005 | 60,000 | | Sm. MPC | 2,721 | Spent Fuel | \$52.75 |
| | 2006 | 60,000 | | Lge. MPC | 2,721 | DHLW/Hdwr. | \$52.75 |
| | 2007 | 60,000 | | DHLW/Hdwr. | 0 | Other | \$52.75 |
| | 2008 | 60,000 | | Other | 0 | | |
| | 2009 | 0 | | | | | |
| | 2010 | 0 | | | | | |
| | EMPLACEMENT COST/PKG: | | | BACKFILL: | | | |
| | -SF Pkgs. | \$7,557 | | -Comp. Fact. | | -Unit Cost/Tn.- | |
| | -DHLW | \$7,557 | | 0.76 | | \$9.66 | |
| | -Other | \$0 | | | | | |

Case 2 Input Values (Cont.)

| EXCAVATED MATERIAL HANDLING: | | GENERAL MAINTENANCE COST: | | BOREHOLE DEVELOPMENT COST | |
|---|--------------|---------------------------|------------------|---------------------------|----------|
| Emplac. | Unit Cost/Tn | Cost/Ton | Cost/Yr. (\$000) | -Unit Cost/Hole | |
| \$32.84 | -Const. | \$0 | \$2,485 | Spent Fuel | \$0.00 |
| \$32.84 | -Emplac. | \$0 | \$4,208 | DHLW | \$0.00 |
| \$32.84 | -Closure | \$0 | \$2,442 | Other | \$0.00 |
| | | | \$2,084 | | |
| UNDERGROUND SERVICE SYS(\$000/Year): | | | | | |
| - Backfill Years- | | Construc. | Emplac. | Caremaker | Closure |
| 2110 | 2120 | \$22,036 | \$32,322 | \$6,063 | \$10,346 |
| | | \$3,496 | \$2,152 | \$1,559 | \$9,346 |
| | | \$3,496 | \$6,865 | \$2,853 | \$2,102 |

Case 2 Input Values (Cont.)

| PRODUCTIVITY FACTORS | Units | Units per Man Year | Fixed Staff/Year | PERFORMANCE |
|----------------------|-----------|--------------------|------------------|--------------|
| | | | | CONFIRMATION |
| Variable- | | | | |
| -Excav. | Tons | 3500.00 | 0 | |
| -Mat. Hand. | Tons | 0.00 | 0 | |
| -Bore. Dev. | Boreholes | 0.00 | 0 | 128 |
| -Emplac. | Packages | 125.00 | 0 | |
| -Backfill | Tons | 37040.00 | 0 | (000) PER YR |
| Fixed- | | | | |
| -Gen. Maint. | Tons | 0 | 21 | |
| -UG Svc. Sys. | Tons | 0 | 239 | |

| YEAR | WASTE PACKAGE QUANTITIES | | | | | | | EXCAVATION TONNAGE(000) | | | | | | | | | |
|------|--------------------------|-----|-----|-----|--------|------|-------|-------------------------|--|--------|-----------------|--------|-------------------|------|-------|-------|-------|
| | Sm | MPC | Lge | MPC | Hdwre. | DHLW | Other | Total | Mining Correcion Ratio Intact | Mix | Common Areas | Intact | Emplacement Areas | | | Total | |
| | | | | | | | | | | | | | Mix | DHLW | Other | | |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 0 | 0 | 0 | 0 | 260 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 29 | 0 | 0 | 0 | 0 | 335 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 31 | 0 | 0 | 0 | 0 | 364 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 101 | 0 | 0 | 0 | 0 | 366 |
| 2010 | 11 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 100.0% | 100.0% | 0 | 177 | 0 | 0 | 0 | 0 | 436 |
| 2011 | 11 | 39 | 33 | 0 | 0 | 0 | 0 | 55 | 100.0% | 100.0% | 0 | 145 | 0 | 0 | 0 | 0 | 379 |
| 2012 | 37 | 33 | 0 | 0 | 0 | 0 | 0 | 50 | 100.0% | 100.0% | 0 | 52 | 0 | 0 | 0 | 0 | 662 |
| 2013 | 65 | 74 | 0 | 0 | 0 | 0 | 0 | 139 | 100.0% | 100.0% | 146 | 953 | 0 | 0 | 0 | 0 | 1,005 |
| 2014 | 53 | 190 | 0 | 0 | 0 | 0 | 0 | 243 | 100.0% | 100.0% | 184 | 881 | 0 | 0 | 0 | 0 | 1,038 |
| 2015 | 19 | 350 | 0 | 0 | 0 | 200 | 0 | 569 | 100.0% | 100.0% | 32 | 966 | 0 | 0 | 0 | 0 | 1,065 |
| 2016 | 54 | 328 | 0 | 0 | 0 | 200 | 0 | 582 | 100.0% | 100.0% | 246 | 833 | 0 | 0 | 0 | 0 | 998 |
| 2017 | 68 | 324 | 0 | 0 | 0 | 200 | 0 | 591 | 100.0% | 100.0% | 138 | 907 | 0 | 0 | 0 | 0 | 1,078 |
| 2018 | 12 | 355 | 0 | 0 | 0 | 200 | 0 | 567 | 100.0% | 100.0% | 122 | 921 | 0 | 0 | 0 | 0 | 1,045 |
| 2019 | 90 | 306 | 0 | 0 | 0 | 200 | 0 | 586 | 100.0% | 100.0% | 91 | 953 | 0 | 0 | 0 | 0 | 1,044 |
| 2020 | 51 | 333 | 0 | 0 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 54 | 952 | 0 | 0 | 0 | 0 | 1,044 |
| 2021 | 45 | 339 | 0 | 0 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 200 | 862 | 0 | 0 | 0 | 0 | 1,005 |
| 2022 | 33 | 350 | 0 | 0 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 183 | 878 | 0 | 0 | 0 | 0 | 1,062 |
| 2023 | 20 | 350 | 0 | 0 | 0 | 200 | 0 | 569 | 100.0% | 100.0% | 153 | 892 | 0 | 0 | 0 | 0 | 1,061 |
| 2024 | 73 | 317 | 0 | 0 | 0 | 200 | 0 | 590 | 100.0% | 100.0% | 286 | 832 | 0 | 0 | 0 | 0 | 1,045 |
| 2025 | 67 | 323 | 0 | 0 | 0 | 200 | 0 | 590 | 100.0% | 100.0% | 14 | 985 | 0 | 0 | 0 | 0 | 1,118 |
| 2026 | 56 | 328 | 0 | 0 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 91 | 946 | 0 | 0 | 0 | 0 | 999 |
| 2027 | 105 | 308 | 0 | 0 | 0 | 200 | 0 | 611 | 100.0% | 100.0% | 243 | 836 | 0 | 0 | 0 | 0 | 1,038 |
| 2028 | 5 | 362 | 0 | 0 | 0 | 200 | 0 | 567 | 100.0% | 100.0% | 220 | 868 | 0 | 0 | 0 | 0 | 1,079 |
| 2029 | 34 | 348 | 0 | 0 | 0 | 200 | 0 | 581 | 100.0% | 100.0% | 629 | 602 | 0 | 0 | 0 | 0 | 1,088 |
| 2030 | 89 | 307 | 0 | 0 | 0 | 200 | 0 | 597 | 100.0% | 100.0% | 395 | 766 | 0 | 0 | 0 | 0 | 1,231 |
| 2031 | 81 | 319 | 0 | 0 | 0 | 200 | 0 | 600 | 100.0% | 100.0% | 172 | 907 | 0 | 0 | 0 | 0 | 1,161 |
| 2032 | 231 | 221 | 0 | 0 | 0 | 200 | 0 | 653 | 100.0% | 100.0% | 17 | 1,008 | 0 | 0 | 0 | 0 | 1,079 |
| 2033 | 145 | 281 | 0 | 0 | 0 | 200 | 0 | 627 | 100.0% | 100.0% | 83 | 958 | 0 | 0 | 0 | 0 | 1,025 |
| 2034 | 63 | 333 | 0 | 0 | 0 | 200 | 0 | 597 | 100.0% | 100.0% | 130 | 914 | 0 | 0 | 0 | 0 | 1,040 |
| 2035 | 6 | 371 | 0 | 0 | 0 | 200 | 0 | 577 | 100.0% | 100.0% | 123 | 924 | 0 | 0 | 0 | 0 | 1,044 |
| 2036 | 30 | 352 | 0 | 0 | 0 | 200 | 0 | 582 | 100.0% | 100.0% | 290 | 784 | 0 | 0 | 0 | 0 | 1,047 |
| 2037 | 48 | 336 | 0 | 0 | 0 | 76 | 0 | 460 | 100.0% | 100.0% | 98 | 932 | 0 | 0 | 0 | 0 | 1,075 |
| 2038 | 45 | 340 | 0 | 0 | 0 | 37 | 0 | 422 | 100.0% | 100.0% | 132 | 190 | 0 | 0 | 0 | 0 | 1,030 |
| 2039 | 107 | 288 | 0 | 0 | 0 | 0 | 0 | 395 | 100.0% | 100.0% | 10 | 254 | 0 | 0 | 0 | 0 | 322 |
| 2040 | 36 | 342 | 0 | 0 | 0 | 0 | 0 | 378 | 100.0% | 100.0% | 186 | 137 | 0 | 0 | 0 | 0 | 265 |
| 2041 | 49 | 70 | 0 | 0 | 0 | 0 | 0 | 118 | 100.0% | 100.0% | 32 | 244 | 0 | 0 | 0 | 0 | 323 |
| | | | | | | | | | | | | | | | | | 276 |

| YEAR | EXCAVATION COST(\$000) | | | DHLW Areas | Other | TOTAL EXCAVATION COST | EXCAVATED MATERIAL HAND. COST (\$000) | CNSTRCT PHASE | EMPLCMNT PHASE | GENERAL MAINTENANCE COST (\$000) | CNSTRCT PHASE | EMPLCMNT PHASE | CARETRK PHASE | C&D PHASE |
|------|------------------------|------------------|---------------|------------|-------|-----------------------|---------------------------------------|---------------|----------------|----------------------------------|---------------|----------------|---------------|-----------|
| | Common Areas | Spent Fuel Areas | EMPLCMN PHASE | | | | | | | | | | | |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | \$0 | | | | 0 |
| 2005 | \$3,165 | \$10,551 | \$10,551 | \$0 | \$0 | \$13,716 | \$1,924 | | | \$2,485 | | | | 0 |
| 2006 | \$3,165 | \$14,507 | \$14,507 | \$0 | \$0 | \$17,673 | \$2,479 | | | \$2,485 | | | | 0 |
| 2007 | \$3,165 | \$16,062 | \$16,062 | \$0 | \$0 | \$19,228 | \$2,697 | | | \$2,485 | | | | 0 |
| 2008 | \$3,165 | \$16,122 | \$16,122 | \$0 | \$0 | \$19,288 | \$2,706 | | | \$2,485 | | | | 0 |
| 2009 | \$3,165 | \$19,819 | \$19,819 | \$0 | \$0 | \$22,984 | \$3,224 | | | \$2,485 | | | | 0 |
| 2010 | \$0 | \$12,450 | \$12,450 | \$0 | \$0 | \$12,450 | \$1,135 | | 1135 | \$4,208 | | | | 0 |
| 2011 | \$0 | \$21,738 | \$21,738 | \$0 | \$0 | \$21,738 | \$1,982 | | 1982 | \$4,208 | | | | 0 |
| 2012 | \$0 | \$32,983 | \$32,983 | \$0 | \$0 | \$32,983 | \$3,008 | | 3008 | \$4,208 | | | | 0 |
| 2013 | \$0 | \$34,095 | \$34,095 | \$0 | \$0 | \$34,095 | \$3,109 | | 3109 | \$4,208 | | | | 0 |
| 2014 | \$0 | \$34,962 | \$34,962 | \$0 | \$0 | \$34,962 | \$3,188 | | 3188 | \$4,208 | | | | 0 |
| 2015 | \$0 | \$32,772 | \$32,772 | \$0 | \$0 | \$32,772 | \$2,988 | | 2988 | \$4,208 | | | | 0 |
| 2016 | \$0 | \$35,418 | \$35,418 | \$0 | \$0 | \$35,418 | \$3,229 | | 3229 | \$4,208 | | | | 0 |
| 2017 | \$0 | \$34,304 | \$34,304 | \$0 | \$0 | \$34,304 | \$3,128 | | 3128 | \$4,208 | | | | 0 |
| 2018 | \$0 | \$34,275 | \$34,275 | \$0 | \$0 | \$34,275 | \$3,125 | | 3125 | \$4,208 | | | | 0 |
| 2019 | \$0 | \$34,274 | \$34,274 | \$0 | \$0 | \$34,274 | \$3,125 | | 3125 | \$4,208 | | | | 0 |
| 2020 | \$0 | \$33,010 | \$33,010 | \$0 | \$0 | \$33,010 | \$3,010 | | 3010 | \$4,208 | | | | 0 |
| 2021 | \$0 | \$34,878 | \$34,878 | \$0 | \$0 | \$34,878 | \$3,180 | | 3180 | \$4,208 | | | | 0 |
| 2022 | \$0 | \$34,839 | \$34,839 | \$0 | \$0 | \$34,839 | \$3,177 | | 3177 | \$4,208 | | | | 0 |
| 2023 | \$0 | \$34,333 | \$34,333 | \$0 | \$0 | \$34,333 | \$3,131 | | 3131 | \$4,208 | | | | 0 |
| 2024 | \$0 | \$36,707 | \$36,707 | \$0 | \$0 | \$36,707 | \$3,347 | | 3347 | \$4,208 | | | | 0 |
| 2025 | \$0 | \$32,808 | \$32,808 | \$0 | \$0 | \$32,808 | \$2,991 | | 2991 | \$4,208 | | | | 0 |
| 2026 | \$0 | \$34,080 | \$34,080 | \$0 | \$0 | \$34,080 | \$3,107 | | 3107 | \$4,208 | | | | 0 |
| 2027 | \$0 | \$35,437 | \$35,437 | \$0 | \$0 | \$35,437 | \$3,231 | | 3231 | \$4,208 | | | | 0 |
| 2028 | \$0 | \$35,719 | \$35,719 | \$0 | \$0 | \$35,719 | \$3,257 | | 3257 | \$4,208 | | | | 0 |
| 2029 | \$0 | \$40,444 | \$40,444 | \$0 | \$0 | \$40,444 | \$3,688 | | 3688 | \$4,208 | | | | 0 |
| 2030 | \$0 | \$38,141 | \$38,141 | \$0 | \$0 | \$38,141 | \$3,478 | | 3478 | \$4,208 | | | | 0 |
| 2031 | \$0 | \$35,436 | \$35,436 | \$0 | \$0 | \$35,436 | \$3,231 | | 3231 | \$4,208 | | | | 0 |
| 2032 | \$0 | \$33,677 | \$33,677 | \$0 | \$0 | \$33,677 | \$3,071 | | 3071 | \$4,208 | | | | 0 |
| 2033 | \$0 | \$34,158 | \$34,158 | \$0 | \$0 | \$34,158 | \$3,115 | | 3115 | \$4,208 | | | | 0 |
| 2034 | \$0 | \$34,282 | \$34,282 | \$0 | \$0 | \$34,282 | \$3,126 | | 3126 | \$4,208 | | | | 0 |
| 2035 | \$0 | \$34,392 | \$34,392 | \$0 | \$0 | \$34,392 | \$3,136 | | 3136 | \$4,208 | | | | 0 |
| 2036 | \$0 | \$35,293 | \$35,293 | \$0 | \$0 | \$35,293 | \$3,218 | | 3218 | \$4,208 | | | | 0 |
| 2037 | \$0 | \$33,818 | \$33,818 | \$0 | \$0 | \$33,818 | \$3,084 | | 3084 | \$4,208 | | | | 0 |
| 2038 | \$0 | \$10,570 | \$10,570 | \$0 | \$0 | \$10,570 | \$964 | | 964 | \$4,208 | | | | 0 |
| 2039 | \$0 | \$8,691 | \$8,691 | \$0 | \$0 | \$8,691 | \$792 | | 792 | \$4,208 | | | | 0 |
| 2040 | \$0 | \$10,621 | \$10,621 | \$0 | \$0 | \$10,621 | \$968 | | 968 | \$4,208 | | | | 0 |
| 2041 | \$0 | \$9,051 | \$9,051 | \$0 | \$0 | \$9,051 | \$825 | | 825 | \$4,208 | | | | 0 |
| 2042 | \$0 | \$17,312 | \$17,312 | \$0 | \$0 | \$17,312 | \$1,579 | | 1579 | \$4,208 | | | | 0 |
| 2043 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2044 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |
| 2050 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | | | 0 |

| YEAR | BOREHOLE DEV. COST (\$000) | | | EMPLACEMENT COST(\$000) | | | BACKFILL-DEV AREAS | | | | | | | |
|------|----------------------------|------|-------|-------------------------|---------------|---------------|--------------------|----------|----------------------|----------------|---------------|---------|------------|--------------|
| | SF Pkgs | DHLW | Other | Total | CNSTRCT PHASE | EMPLCMN PHASE | SF Pkgs | DHLW/Hdw | Confirmation Removal | EMPLCMNT PHASE | CARETKR PHASE | Total | Tons (000) | COST (\$000) |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2005 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2006 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2007 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2008 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2009 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2010 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2011 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$414 | \$0 | \$0 | \$0 | 0 | \$414 | 0 | \$0 |
| 2012 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$377 | \$0 | \$0 | \$0 | 0 | \$377 | 0 | \$0 |
| 2013 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$527 | \$0 | \$0 | \$0 | 0 | \$527 | 0 | \$0 |
| 2014 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$1,053 | \$0 | \$0 | \$0 | 0 | \$1,053 | 0 | \$0 |
| 2015 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$1,838 | \$0 | \$0 | \$0 | 0 | \$1,838 | 0 | \$0 |
| 2016 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,790 | \$1,511 | \$0 | \$0 | 0 | \$4,301 | 0 | \$0 |
| 2017 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,863 | \$1,511 | \$0 | \$0 | 0 | \$4,374 | 0 | \$0 |
| 2018 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,956 | \$1,511 | \$0 | \$0 | 0 | \$4,467 | 0 | \$0 |
| 2019 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,771 | \$1,511 | \$0 | \$0 | 0 | \$4,282 | 0 | \$0 |
| 2020 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,995 | \$1,511 | \$0 | \$0 | 0 | \$4,506 | 0 | \$0 |
| 2021 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,901 | \$1,511 | \$128 | \$128 | 128 | \$4,540 | 0 | \$0 |
| 2022 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,898 | \$1,511 | \$0 | \$0 | 0 | \$4,409 | 0 | \$0 |
| 2023 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,898 | \$1,511 | \$0 | \$0 | 0 | \$4,409 | 0 | \$0 |
| 2024 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,791 | \$1,511 | \$0 | \$0 | 0 | \$4,302 | 0 | \$0 |
| 2025 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,949 | \$1,511 | \$0 | \$0 | 0 | \$4,460 | 0 | \$0 |
| 2026 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,946 | \$1,511 | \$0 | \$0 | 0 | \$4,457 | 0 | \$0 |
| 2027 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,903 | \$1,511 | \$0 | \$0 | 0 | \$4,414 | 0 | \$0 |
| 2028 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,104 | \$1,511 | \$0 | \$0 | 0 | \$4,615 | 0 | \$0 |
| 2029 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,774 | \$1,511 | \$0 | \$0 | 0 | \$4,285 | 0 | \$0 |
| 2030 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,882 | \$1,511 | \$0 | \$0 | 0 | \$4,393 | 0 | \$0 |
| 2031 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,987 | \$1,511 | \$128 | \$128 | 128 | \$4,636 | 0 | \$0 |
| 2032 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,020 | \$1,511 | \$0 | \$0 | 0 | \$4,532 | 0 | \$0 |
| 2033 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,420 | \$1,511 | \$0 | \$0 | 0 | \$4,931 | 0 | \$0 |
| 2034 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,225 | \$1,511 | \$0 | \$0 | 0 | \$4,737 | 0 | \$0 |
| 2035 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,996 | \$1,511 | \$0 | \$0 | 0 | \$4,507 | 0 | \$0 |
| 2036 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,848 | \$1,511 | \$0 | \$0 | 0 | \$4,359 | 0 | \$0 |
| 2037 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,888 | \$1,511 | \$0 | \$0 | 0 | \$4,400 | 0 | \$0 |
| 2038 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,899 | \$574 | \$0 | \$0 | 0 | \$3,473 | 0 | \$0 |
| 2039 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,908 | \$280 | \$0 | \$0 | 0 | \$3,188 | 0 | \$0 |
| 2040 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,984 | \$0 | \$0 | \$0 | 0 | \$2,984 | 0 | \$0 |
| 2041 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,860 | \$0 | \$128 | \$128 | 128 | \$2,988 | 0 | \$0 |
| 2042 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$894 | \$0 | \$0 | \$0 | 0 | \$894 | 0 | \$0 |
| 2043 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$735 | \$0 | \$0 | \$0 | 0 | \$735 | 0 | \$0 |
| 2044 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$898 | \$0 | \$0 | \$0 | 0 | \$898 | 0 | \$0 |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$765 | \$0 | \$0 | \$0 | 0 | \$765 | 0 | \$0 |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$1,464 | \$0 | \$0 | \$0 | 0 | \$1,464 | 0 | \$0 |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |

UNDERGROUND SERVICE SYSTEMS COST

| YEAR | Support Sys. F.ac. | CONSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | CAD PHASE | Utilities | CONSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | CAD PHASE | Monitoring | CONSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | CAD PHASE | Total Svc Syst Cost |
|------|--------------------|----------------|---------------|---------------|-----------|-----------|----------------|---------------|---------------|-----------|------------|----------------|---------------|---------------|-----------|---------------------|
| 1997 | \$0 | | | | | | | | | | | | | | | \$0 |
| 1998 | \$0 | | | | | | | | | | | | | | | \$0 |
| 1999 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2000 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2001 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2002 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2003 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2004 | \$0 | | | | | | | | | | | | | | | \$0 |
| 2005 | \$22,036 | | | | | \$3,486 | | | | | \$3,486 | | | | | \$29,000 |
| 2006 | \$22,036 | \$22,036 | | | | \$3,486 | | | | | \$3,486 | | | | | \$29,000 |
| 2007 | \$22,036 | \$22,036 | | | | \$3,486 | | | | | \$3,486 | | | | | \$29,000 |
| 2008 | \$22,036 | \$22,036 | | | | \$3,486 | | | | | \$3,486 | | | | | \$29,000 |
| 2009 | \$22,036 | \$22,036 | | | | \$3,486 | | | | | \$3,486 | | | | | \$29,000 |
| 2010 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2011 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2012 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2013 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2014 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2015 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2016 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2017 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2018 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2019 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2020 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2021 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2022 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2023 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2024 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2025 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2026 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2027 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2028 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2029 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2030 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2031 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2032 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2033 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2034 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2035 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2036 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2037 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2038 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2039 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2040 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2041 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2042 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2043 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2044 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2045 | \$0 | | | | | \$2,152 | | | | | \$2,152 | | | | | \$4,139 |
| 2046 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2047 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2048 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2049 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2050 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2051 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2052 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2053 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2054 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2055 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2056 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2057 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2058 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2059 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2060 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2061 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |
| 2062 | \$6,063 | | | | | \$1,559 | | | | | \$1,559 | | | | | \$10,504 |

Case 2

| YEAR | TOTAL COST | | TOTAL COST | | | | |
|------|------------|-------------|----------------|---------------|-----------|---------------|-------|
| | (\$000) | in Millions | EMPLCMNT PHASE | CARETKR PHASE | C&D PHASE | CNSTRCT PHASE | PHASE |
| 1997 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 1998 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 1999 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2000 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2001 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2002 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2003 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2004 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 | 0 |
| 2005 | \$47,126 | \$47.13 | \$47,126 | 0 | 0 | 0 | 0 |
| 2006 | \$51,637 | \$51.64 | \$51,637 | 0 | 0 | 0 | 0 |
| 2007 | \$53,410 | \$53.41 | \$53,410 | 0 | 0 | 0 | 0 |
| 2008 | \$53,479 | \$53.48 | \$53,479 | 0 | 0 | 0 | 0 |
| 2009 | \$57,693 | \$57.69 | \$57,693 | 0 | 0 | 0 | 0 |
| 2010 | \$59,546 | \$59.55 | \$59,546 | 59546 | 0 | 0 | 0 |
| 2011 | \$69,644 | \$69.64 | \$69,644 | 69644 | 0 | 0 | 0 |
| 2012 | \$82,076 | \$82.08 | \$82,076 | 82076 | 0 | 0 | 0 |
| 2013 | \$83,803 | \$83.80 | \$83,803 | 83803 | 0 | 0 | 0 |
| 2014 | \$85,535 | \$85.54 | \$85,535 | 85535 | 0 | 0 | 0 |
| 2015 | \$85,609 | \$85.61 | \$85,609 | 85609 | 0 | 0 | 0 |
| 2016 | \$88,589 | \$88.59 | \$88,589 | 88589 | 0 | 0 | 0 |
| 2017 | \$87,447 | \$87.45 | \$87,447 | 87447 | 0 | 0 | 0 |
| 2018 | \$87,230 | \$87.23 | \$87,230 | 87230 | 0 | 0 | 0 |

Case 2

| | | | | | | |
|------|----------|---------|-----|-------|---|---|
| 2019 | \$87,453 | \$87.45 | \$0 | 87453 | 0 | 0 |
| 2020 | \$86,107 | \$86.11 | \$0 | 86107 | 0 | 0 |
| 2021 | \$88,012 | \$88.01 | \$0 | 88012 | 0 | 0 |
| 2022 | \$87,972 | \$87.97 | \$0 | 87972 | 0 | 0 |
| 2023 | \$87,313 | \$87.31 | \$0 | 87313 | 0 | 0 |
| 2024 | \$90,062 | \$90.06 | \$0 | 90062 | 0 | 0 |
| 2025 | \$85,801 | \$85.80 | \$0 | 85801 | 0 | 0 |
| 2026 | \$87,149 | \$87.15 | \$0 | 87149 | 0 | 0 |
| 2027 | \$88,831 | \$88.83 | \$0 | 88831 | 0 | 0 |
| 2028 | \$88,809 | \$88.81 | \$0 | 88809 | 0 | 0 |
| 2029 | \$94,072 | \$94.07 | \$0 | 94072 | 0 | 0 |
| 2030 | \$91,802 | \$91.80 | \$0 | 91802 | 0 | 0 |
| 2031 | \$88,746 | \$88.75 | \$0 | 88746 | 0 | 0 |
| 2032 | \$87,226 | \$87.23 | \$0 | 87226 | 0 | 0 |
| 2033 | \$87,556 | \$87.56 | \$0 | 87556 | 0 | 0 |
| 2034 | \$87,463 | \$87.46 | \$0 | 87463 | 0 | 0 |
| 2035 | \$87,434 | \$87.43 | \$0 | 87434 | 0 | 0 |
| 2036 | \$88,458 | \$88.46 | \$0 | 88458 | 0 | 0 |
| 2037 | \$85,922 | \$85.92 | \$0 | 85922 | 0 | 0 |
| 2038 | \$60,269 | \$60.27 | \$0 | 60269 | 0 | 0 |
| 2039 | \$58,015 | \$58.01 | \$0 | 58015 | 0 | 0 |
| 2040 | \$60,124 | \$60.12 | \$0 | 60124 | 0 | 0 |
| 2041 | \$56,317 | \$56.32 | \$0 | 56317 | 0 | 0 |
| 2042 | \$65,173 | \$65.17 | \$0 | 65173 | 0 | 0 |
| 2043 | \$46,445 | \$46.45 | \$0 | 46445 | 0 | 0 |
| 2044 | \$46,312 | \$46.31 | \$0 | 46312 | 0 | 0 |
| 2045 | \$47,011 | \$47.01 | \$0 | 47011 | 0 | 0 |

Case 2

| | | | | | | |
|------|----------|---------|-----|---|-------|---|
| 2046 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2047 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2048 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2049 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2050 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2051 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2052 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2053 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2054 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2055 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2056 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2057 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2058 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2059 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2060 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2061 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2062 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2063 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2064 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2065 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2066 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2067 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2068 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2069 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2070 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2071 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2072 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |

Case 2

| | | | | | | |
|------|----------|---------|-----|---|-------|---|
| 2073 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2074 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2075 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2076 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2077 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2078 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2079 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2080 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2081 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2082 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2083 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2084 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2085 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2086 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2087 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2088 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2089 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2090 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2091 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2092 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2093 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2094 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2095 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2096 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2097 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2098 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2099 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |

Case 2

| | | | | | | |
|-------|-------------|------------|-----------|-------------|-----------|-----------|
| 2100 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2101 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2102 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2103 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2104 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2105 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2106 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2107 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2108 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2109 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2110 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2111 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2112 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2113 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2114 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2115 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2116 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2117 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2118 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2119 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2120 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| <hr/> | | | | | | |
| | \$4,203,029 | \$4,203.03 | \$263,345 | \$2,845,334 | \$829,458 | \$264,892 |

Case 2

AVERAGE DAILY STAFFING

| YEAR | Excav. | Excav. Mat.Hand. | Gen. Maint. | Borehole Develop. | Emplacem | Backfill | UG Svc. Sys. | TOTAL |
|------|--------|---------------------|----------------|----------------------|----------|----------|-----------------|-------|
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 74 | 0 | 21 | 0 | 0 | 0 | 239 | 334 |
| 2006 | 96 | 0 | 21 | 0 | 0 | 0 | 239 | 356 |
| 2007 | 104 | 0 | 21 | 0 | 0 | 0 | 239 | 364 |
| 2008 | 104 | 0 | 21 | 0 | 0 | 0 | 239 | 364 |
| 2009 | 124 | 0 | 21 | 0 | 0 | 0 | 239 | 384 |
| 2010 | 108 | 0 | 21 | 0 | 0 | 0 | 239 | 369 |
| 2011 | 189 | 0 | 21 | 0 | 0 | 0 | 239 | 450 |
| 2012 | 287 | 0 | 21 | 0 | 1 | 0 | 239 | 548 |
| 2013 | 297 | 0 | 21 | 0 | 1 | 0 | 239 | 558 |
| 2014 | 304 | 0 | 21 | 0 | 2 | 0 | 239 | 566 |
| 2015 | 285 | 0 | 21 | 0 | 5 | 0 | 239 | 550 |
| 2016 | 308 | 0 | 21 | 0 | 5 | 0 | 239 | 573 |
| 2017 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2018 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |

Case 2

| | | | | | | | | |
|------|-----|---|----|---|---|---|-----|-----|
| 2019 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2020 | 287 | 0 | 21 | 0 | 5 | 0 | 239 | 552 |
| 2021 | 303 | 0 | 21 | 0 | 5 | 0 | 239 | 568 |
| 2022 | 303 | 0 | 21 | 0 | 5 | 0 | 239 | 568 |
| 2023 | 299 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2024 | 319 | 0 | 21 | 0 | 5 | 0 | 239 | 584 |
| 2025 | 285 | 0 | 21 | 0 | 5 | 0 | 239 | 550 |
| 2026 | 296 | 0 | 21 | 0 | 5 | 0 | 239 | 561 |
| 2027 | 308 | 0 | 21 | 0 | 5 | 0 | 239 | 573 |
| 2028 | 311 | 0 | 21 | 0 | 5 | 0 | 239 | 575 |
| 2029 | 352 | 0 | 21 | 0 | 5 | 0 | 239 | 616 |
| 2030 | 332 | 0 | 21 | 0 | 5 | 0 | 239 | 597 |
| 2031 | 308 | 0 | 21 | 0 | 5 | 0 | 239 | 573 |
| 2032 | 293 | 0 | 21 | 0 | 5 | 0 | 239 | 558 |
| 2033 | 297 | 0 | 21 | 0 | 5 | 0 | 239 | 562 |
| 2034 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2035 | 299 | 0 | 21 | 0 | 5 | 0 | 239 | 564 |
| 2036 | 307 | 0 | 21 | 0 | 5 | 0 | 239 | 572 |
| 2037 | 294 | 0 | 21 | 0 | 4 | 0 | 239 | 558 |
| 2038 | 92 | 0 | 21 | 0 | 3 | 0 | 239 | 355 |
| 2039 | 76 | 0 | 21 | 0 | 3 | 0 | 239 | 339 |
| 2040 | 92 | 0 | 21 | 0 | 3 | 0 | 239 | 355 |
| 2041 | 79 | 0 | 21 | 0 | 1 | 0 | 239 | 340 |
| 2042 | 151 | 0 | 21 | 0 | 1 | 0 | 239 | 411 |
| 2043 | 0 | 0 | 21 | 0 | 1 | 0 | 239 | 261 |
| 2044 | 0 | 0 | 21 | 0 | 1 | 0 | 239 | 261 |
| 2045 | 0 | 0 | 21 | 0 | 2 | 0 | 239 | 262 |

Case 2

| | | | | | | | | | | |
|------|---|---|---|---|----|---|---|---|----|----|
| 2046 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2047 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2048 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2049 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2050 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2051 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2052 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2053 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2054 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2055 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2056 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2057 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2058 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2059 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2060 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2061 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2062 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2063 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2064 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2065 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2066 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2067 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2068 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2069 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2070 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2071 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2072 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |

Case 2

| | | | | | | | | |
|------|---|---|----|---|---|---|----|----|
| 2073 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2074 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2075 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2076 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2077 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2078 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2079 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2080 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2081 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2082 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2083 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2084 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2085 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2086 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2087 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2088 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2089 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2090 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2091 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2092 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2093 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2094 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2095 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2096 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2097 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2098 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2099 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |

Case 2

| | | | | | | | | | | | | | | | | | |
|------|---|---|---|---|----|---|---|---|---|------|---|------|----|-----|---|-------|-------|
| 2100 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2101 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2102 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2103 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2104 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2105 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2106 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2107 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2108 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2109 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 | | | | |
| 2110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| 2120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | |
| | | | | | | | | | | 9159 | 0 | 2205 | 0 | 127 | 6 | 13383 | 24880 |

Case 2

| Project Phase | TOTAL COST |
|----------------------|-----------------------|
| -Construction | \$263,345 |
| -Emplacement | \$2,845,334 |
| -Caretaker | \$829,458 |
| -Closure | \$264,892 |
| | \$4,203,029 |

CASE 3

UNDERGROUND COST FOR THE BASELINE CONCEPT EVALUATED AT 123 YEARS

| EXCAVATION: | | -Tons- | -Unit Cost/Ton- | Const. |
|--------------------------|--------------|----------|-----------------|---------|
| -Common Areas | | | | |
| -Year- | | | | |
| 2005 | 60,000 | | | \$52.75 |
| 2006 | 60,000 | | | \$52.75 |
| 2007 | 60,000 | | | \$52.75 |
| 2008 | 60,000 | | | \$52.75 |
| 2009 | 60,000 | | | \$52.75 |
| 2010 | 0 | | | \$52.75 |
| SPREADSHEET INPUT VALUES | | | | |
| -Emplacement Areas- | | | | |
| | Form | Tons/Pkg | | |
| | Intact | 610 | Comm Area | |
| | Mix | 610 | Spent Fuel | |
| | DHLW/Hdwr. | 0 | DHLW/Hdwr. | |
| | Other | 0 | Other | |
| -Unit Cost/Ton- | | | | |
| BACKFILL: | | | | |
| | -Comp. Fac.- | 0.76 | | \$9.66 |
| EMPLACEMENT COST/PKG: | | | | |
| -SF Pkgs. | \$6,571 | | | |
| -DHLW | \$6,571 | | | |
| -Other | \$0 | | | |

Case 3 Input Values (Cont.)

| | | EXCAVATED MATERIAL HANDLING | GENERAL MAINTENANCE COST: | Cost/Ton | Cost/Yr (\$000) | BOREHOLE DEVELOPMENT COST |
|------------------|--------|--------------------------------------|---------------------------|-----------|-----------------|---------------------------|
| Emplac | | Unit Cost/Tn | -Constr. | | | -Unit Cost/Hole |
| \$32.84 | \$7.40 | -Const. | -Emplac | \$0 | \$2,259 | |
| \$32.84 | \$2.99 | -Emplac. | -Caretak. | \$0 | \$3,825 | Spent Fuel |
| \$32.84 | \$0.00 | -Closure | -Closure | \$0 | \$2,220 | DHLW |
| | | | | | \$1,895 | Other |
| | | | | | | |
| | | UNDERGROUND SERVICE SYS(\$000/Year): | | Construc. | Emplac | Caretaker |
| -Backfill Years- | | -Support System Fac. | | \$20,032 | \$29,384 | \$5,512 |
| 2110 | 2120 | -Utilities | | \$3,151 | \$1,956 | \$1,417 |
| | | -Monitoring | | \$3,180 | \$6,241 | \$2,621 |
| | | | | | | Closure |
| | | | | | | \$10,346 |
| | | | | | | \$9,346 |
| | | | | | | \$2,102 |

Case 3 Input Values (Cont.)

| PRODUCTIVITY FACTORS | Units | Units per Man Year | Fixed Staff/Year | PERFORMANCE CONFIRMATION |
|----------------------|-----------|--------------------|------------------|--------------------------|
| Variable- | | | | |
| -Excav. | Tons | 3500.00 | 0 | |
| -Mat. Hand. | Tons | 0.00 | 0 | |
| -Bore. Dev. | Boreholes | 30.00 | 0 | 107 |
| -Emplac. | Packages | 125.00 | 0 | |
| -Backfill | Tons | 37040.00 | 0 | (000) PER YR |
| Fixed- | | | | |
| -Gen. Maint. | Tons | 0 | 21 | |
| -UG Svc. Sys. | Tons | 0 | 239 | |

| YEAR | WASTE PACKAGE QUANTITIES | | | | | | EXCAVATION TONNAGE(000) | | | | | | |
|------|--------------------------|------|--------|------|-------|-------|-------------------------|--------|--------------|-----|-------------------|-----|-------|
| | Intact | Mix | Hdwre. | DHLW | Other | Total | Mining Correction Ratio | | Common Areas | | Emplacement Areas | | Total |
| | | | | | | | Intact | Mix | Intact | Mix | Intact | Mix | |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 0 | 0 | 260 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 0 | 0 | 335 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 15 | 0 | 0 | 350 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 15 | 275 | 0 | 350 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 82 | 275 | 0 | 397 |
| 2010 | 26 | 181 | 0 | 0 | 0 | 207 | 58.6% | 68.0% | 0 | 88 | 176 | 0 | 264 |
| 2011 | 27 | 159 | 0 | 0 | 0 | 186 | 45.2% | 50.5% | 0 | 75 | 454 | 0 | 529 |
| 2012 | 111 | 135 | 0 | 0 | 0 | 246 | 50.6% | 58.1% | 0 | 33 | 847 | 0 | 880 |
| 2013 | 156 | 306 | 0 | 0 | 0 | 462 | 53.1% | 64.0% | 0 | 95 | 801 | 0 | 896 |
| 2014 | 128 | 782 | 0 | 0 | 0 | 910 | 72.9% | 69.6% | 0 | 111 | 800 | 0 | 911 |
| 2015 | 57 | 1442 | 0 | 800 | 0 | 2,299 | 66.1% | 76.7% | 0 | 17 | 881 | 0 | 898 |
| 2016 | 161 | 1350 | 0 | 800 | 0 | 2,311 | 80.4% | 82.6% | 0 | 165 | 765 | 0 | 929 |
| 2017 | 183 | 1333 | 0 | 800 | 0 | 2,316 | 94.4% | 90.0% | 0 | 92 | 836 | 0 | 929 |
| 2018 | 28 | 1462 | 0 | 800 | 0 | 2,290 | 94.8% | 92.6% | 0 | 66 | 848 | 0 | 914 |
| 2019 | 271 | 1260 | 0 | 800 | 0 | 2,331 | 97.2% | 96.8% | 0 | 36 | 879 | 0 | 940 |
| 2020 | 152 | 1372 | 0 | 800 | 0 | 2,324 | 98.5% | 99.2% | 0 | 135 | 803 | 0 | 914 |
| 2021 | 108 | 1394 | 0 | 800 | 0 | 2,302 | 99.9% | 98.6% | 0 | 124 | 820 | 0 | 939 |
| 2022 | 100 | 1442 | 0 | 800 | 0 | 2,342 | 102.5% | 99.2% | 0 | 105 | 845 | 0 | 945 |
| 2023 | 59 | 1440 | 0 | 800 | 0 | 2,299 | 95.9% | 99.8% | 0 | 159 | 793 | 0 | 950 |
| 2024 | 220 | 1305 | 0 | 800 | 0 | 2,325 | 105.9% | 105.6% | 0 | 9 | 742 | 0 | 952 |
| 2025 | 202 | 1328 | 0 | 800 | 0 | 2,330 | 106.3% | 107.8% | 0 | 59 | 706 | 0 | 752 |
| 2026 | 169 | 1350 | 0 | 800 | 0 | 2,319 | 110.8% | 116.4% | 0 | 168 | 600 | 0 | 765 |
| 2027 | 252 | 1259 | 0 | 800 | 0 | 2,311 | 123.0% | 120.3% | 0 | 123 | 628 | 0 | 768 |
| 2028 | 15 | 1491 | 0 | 800 | 0 | 2,306 | 123.7% | 122.5% | 0 | 443 | 383 | 0 | 751 |
| 2029 | 92 | 1432 | 0 | 800 | 0 | 2,324 | 127.7% | 123.5% | 0 | 281 | 548 | 0 | 826 |
| 2030 | 268 | 1265 | 0 | 800 | 0 | 2,333 | 118.2% | 122.8% | 0 | 122 | 782 | 0 | 829 |
| 2031 | 194 | 1313 | 0 | 800 | 0 | 2,307 | 124.9% | 121.5% | 0 | 10 | 977 | 0 | 903 |
| 2032 | 694 | 911 | 0 | 800 | 0 | 2,405 | 128.7% | 130.5% | 0 | 57 | 921 | 0 | 987 |
| 2033 | 438 | 1159 | 0 | 800 | 0 | 2,395 | 135.6% | 135.9% | 0 | 77 | 887 | 0 | 978 |
| 2034 | 190 | 1372 | 0 | 800 | 0 | 2,362 | 131.1% | 133.5% | 0 | 84 | 885 | 0 | 964 |
| 2035 | 15 | 1526 | 0 | 800 | 0 | 2,341 | 127.2% | 131.0% | 0 | 202 | 763 | 0 | 969 |
| 2036 | 91 | 1449 | 0 | 800 | 0 | 2,340 | 113.6% | 126.1% | 0 | 62 | 450 | 0 | 966 |
| 2037 | 124 | 1383 | 0 | 304 | 0 | 1,811 | 113.0% | 131.8% | 0 | 87 | 1 | 0 | 511 |
| 2038 | 136 | 1398 | 0 | 146 | 0 | 1,680 | 109.8% | 123.6% | 0 | 5 | 0 | 0 | 88 |
| 2039 | 320 | 1187 | 0 | 0 | 0 | 1,507 | 122.9% | 133.8% | 0 | 125 | 0 | 0 | 5 |
| 2040 | 96 | 1410 | 0 | 0 | 0 | 1,506 | 132.3% | 137.6% | 0 | 22 | 0 | 0 | 124 |
| 2041 | 142 | 287 | 0 | 0 | 0 | 429 | 103.5% | 123.7% | 0 | 0 | 0 | 0 | 22 |

| | | | | | | | | | | | | |
|------|-----|-----|---|---|-----|--------|--------|--------|-----|---|---|-----|
| 2042 | 9 | 365 | 0 | 0 | 0 | 394 | 97.6% | 115.5% | (0) | 0 | 0 | 302 |
| 2043 | 205 | 208 | 0 | 0 | 413 | 100.3% | 110.7% | 0 | 0 | 0 | 0 | 0 |
| 2044 | 35 | 369 | 0 | 0 | 404 | 110.4% | 124.2% | 0 | 0 | 0 | 0 | 0 |
| 2045 | 518 | 85 | 0 | 0 | 604 | 71.3% | 109.3% | 0 | 0 | 0 | 0 | 0 |
| 2046 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2047 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2048 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2049 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2050 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2051 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2052 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2053 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2054 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2055 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2056 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2057 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2058 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2059 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2060 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2061 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2062 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2063 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2064 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2065 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2066 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2067 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2068 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2069 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2070 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2071 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2072 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2073 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2074 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2075 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2076 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2077 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2078 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2079 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2080 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2081 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2082 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2083 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2084 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2085 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2086 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2087 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2088 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2089 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2090 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |
| 2091 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 |

| YEAR | EXCAVATION COST(\$000) | | DHLW Areas | Other | TOTAL EXCAVATION COST | EXCAVATED MATERIAL HAND COST (\$000) | GENERAL MAINTENANCE COST (\$000) | | GENERAL MAINTENANCE EMPLOMNT PHASE | | CARETKR PHASE | C&D PHASE |
|------|------------------------|------------------|------------|-------|-----------------------|--------------------------------------|----------------------------------|----------------|------------------------------------|----------------|---------------|-----------|
| | Common Areas | Spent Fuel Areas | | | | | CNSTRCT PHASE | EMPLCMNT PHASE | CNSTRCT PHASE | EMPLCMNT PHASE | | |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | 0 |
| 2005 | \$3,165 | \$10,551 | \$0 | \$0 | \$13,716 | \$1,924 | \$1,924 | \$2,259 | 0 | \$2,259 | 0 | 0 |
| 2006 | \$3,165 | \$14,507 | \$0 | \$0 | \$17,673 | \$2,479 | \$2,479 | \$2,259 | 0 | \$2,259 | 0 | 0 |
| 2007 | \$3,165 | \$15,289 | \$0 | \$0 | \$18,454 | \$2,589 | \$2,589 | \$2,259 | 0 | \$2,259 | 0 | 0 |
| 2008 | \$3,165 | \$15,300 | \$0 | \$0 | \$18,465 | \$2,590 | \$2,590 | \$2,259 | 0 | \$2,259 | 0 | 0 |
| 2009 | \$3,165 | \$17,797 | \$0 | \$0 | \$20,962 | \$2,941 | \$2,941 | \$2,259 | 0 | \$2,259 | 0 | 0 |
| 2010 | \$0 | \$8,668 | \$0 | \$0 | \$8,668 | \$790 | \$790 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2011 | \$0 | \$17,357 | \$0 | \$0 | \$17,357 | \$1,583 | \$1,583 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2012 | \$0 | \$28,892 | \$0 | \$0 | \$28,892 | \$2,634 | \$2,634 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2013 | \$0 | \$29,419 | \$0 | \$0 | \$29,419 | \$2,682 | \$2,682 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2014 | \$0 | \$29,912 | \$0 | \$0 | \$29,912 | \$2,727 | \$2,727 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2015 | \$0 | \$29,497 | \$0 | \$0 | \$29,497 | \$2,690 | \$2,690 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2016 | \$0 | \$30,517 | \$0 | \$0 | \$30,517 | \$2,783 | \$2,783 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2017 | \$0 | \$30,503 | \$0 | \$0 | \$30,503 | \$2,781 | \$2,781 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2018 | \$0 | \$30,029 | \$0 | \$0 | \$30,029 | \$2,738 | \$2,738 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2019 | \$0 | \$30,864 | \$0 | \$0 | \$30,864 | \$2,814 | \$2,814 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2020 | \$0 | \$30,012 | \$0 | \$0 | \$30,012 | \$2,737 | \$2,737 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2021 | \$0 | \$30,828 | \$0 | \$0 | \$30,828 | \$2,811 | \$2,811 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2022 | \$0 | \$31,027 | \$0 | \$0 | \$31,027 | \$2,829 | \$2,829 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2023 | \$0 | \$31,199 | \$0 | \$0 | \$31,199 | \$2,845 | \$2,845 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2024 | \$0 | \$31,274 | \$0 | \$0 | \$31,274 | \$2,852 | \$2,852 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2025 | \$0 | \$24,689 | \$0 | \$0 | \$24,689 | \$2,652 | \$2,652 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2026 | \$0 | \$25,122 | \$0 | \$0 | \$25,122 | \$2,291 | \$2,291 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2027 | \$0 | \$25,223 | \$0 | \$0 | \$25,223 | \$2,300 | \$2,300 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2028 | \$0 | \$24,680 | \$0 | \$0 | \$24,680 | \$2,250 | \$2,250 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2029 | \$0 | \$27,136 | \$0 | \$0 | \$27,136 | \$2,474 | \$2,474 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2030 | \$0 | \$27,218 | \$0 | \$0 | \$27,218 | \$2,482 | \$2,482 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2031 | \$0 | \$29,673 | \$0 | \$0 | \$29,673 | \$2,706 | \$2,706 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2032 | \$0 | \$32,404 | \$0 | \$0 | \$32,404 | \$2,955 | \$2,955 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2033 | \$0 | \$32,104 | \$0 | \$0 | \$32,104 | \$2,927 | \$2,927 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2034 | \$0 | \$31,651 | \$0 | \$0 | \$31,651 | \$2,886 | \$2,886 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2035 | \$0 | \$31,834 | \$0 | \$0 | \$31,834 | \$2,903 | \$2,903 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2036 | \$0 | \$31,714 | \$0 | \$0 | \$31,714 | \$2,892 | \$2,892 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2037 | \$0 | \$16,798 | \$0 | \$0 | \$16,798 | \$1,532 | \$1,532 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2038 | \$0 | \$2,884 | \$0 | \$0 | \$2,884 | \$263 | \$263 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2039 | \$0 | \$168 | \$0 | \$0 | \$168 | \$15 | \$15 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2040 | \$0 | \$4,077 | \$0 | \$0 | \$4,077 | \$372 | \$372 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2041 | \$0 | \$706 | \$0 | \$0 | \$706 | \$64 | \$64 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2042 | \$0 | \$9,908 | \$0 | \$0 | \$9,908 | \$903 | \$903 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2043 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2044 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$3,825 | 3825 | \$3,825 | 3825 | 0 |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | 0 | \$0 | 0 | 2220 |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | 0 | \$0 | 0 | 2220 |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | 0 | \$0 | 0 | 2220 |
| 2050 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$2,220 | 0 | \$0 | 0 | 2220 |

| YEAR | SF Pkgs | DHLW | Other | Total | BOREHOLE DEV COST (\$'000) | | EMPLACEMENT COST(\$'000) | | BACKFILL DEV AREAS | | |
|------|----------|---------|-------|----------|----------------------------|---------------|--------------------------|----------|---------------------|----------------|---------------|
| | | | | | CNSTRCT PHASE | EMPLCMN PHASE | SF Pkgs | DHLW/HW | Performance Removal | EMPLCMNT PHASE | CARETRK PHASE |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2005 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2006 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2007 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2008 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2009 | \$2,032 | \$0 | \$0 | \$2,032 | \$2,032 | \$0 | 0 | \$0 | \$0 | 0 | \$0 |
| 2010 | \$1,826 | \$0 | \$0 | \$1,826 | \$0 | \$0 | 1826 | \$0 | \$0 | 0 | \$1,360 |
| 2011 | \$2,415 | \$0 | \$0 | \$2,415 | \$0 | \$0 | 2415 | \$1,222 | \$0 | 0 | \$1,222 |
| 2012 | \$4,536 | \$0 | \$0 | \$4,536 | \$0 | \$0 | 4536 | \$1,616 | \$0 | 0 | \$1,616 |
| 2013 | \$8,935 | \$0 | \$0 | \$8,935 | \$0 | \$0 | 8935 | \$3,036 | \$0 | 0 | \$3,036 |
| 2014 | \$14,718 | \$7,715 | \$0 | \$22,433 | \$0 | \$0 | 22433 | \$9,929 | \$0 | 0 | \$5,980 |
| 2015 | \$14,836 | \$7,715 | \$0 | \$22,551 | \$0 | \$0 | 22551 | \$9,850 | \$5,257 | 107 | \$15,213 |
| 2016 | \$15,032 | \$7,715 | \$0 | \$22,747 | \$0 | \$0 | 22747 | \$9,791 | \$5,257 | 107 | \$15,292 |
| 2017 | \$14,629 | \$7,715 | \$0 | \$22,345 | \$0 | \$0 | 22345 | \$9,962 | \$5,257 | 107 | \$15,325 |
| 2018 | \$15,032 | \$7,715 | \$0 | \$22,747 | \$0 | \$0 | 22747 | \$9,791 | \$5,257 | 107 | \$15,154 |
| 2019 | \$14,963 | \$7,715 | \$0 | \$22,679 | \$0 | \$0 | 22679 | \$10,060 | \$5,257 | 107 | \$15,424 |
| 2020 | \$14,747 | \$7,715 | \$0 | \$22,463 | \$0 | \$0 | 22463 | \$10,054 | \$5,257 | 107 | \$15,378 |
| 2021 | \$15,140 | \$7,715 | \$0 | \$22,855 | \$0 | \$0 | 22855 | \$9,870 | \$5,257 | 107 | \$15,233 |
| 2022 | \$14,718 | \$7,715 | \$0 | \$22,433 | \$0 | \$0 | 22433 | \$10,132 | \$5,257 | 107 | \$15,496 |
| 2023 | \$14,973 | \$7,715 | \$0 | \$22,688 | \$0 | \$0 | 22688 | \$9,850 | \$5,257 | 107 | \$15,213 |
| 2024 | \$15,022 | \$7,715 | \$0 | \$22,737 | \$0 | \$0 | 22737 | \$10,021 | \$5,257 | 107 | \$15,289 |
| 2025 | \$14,914 | \$7,715 | \$0 | \$22,629 | \$0 | \$0 | 22629 | \$10,054 | \$5,257 | 107 | \$15,378 |
| 2026 | \$14,836 | \$7,715 | \$0 | \$22,551 | \$0 | \$0 | 22551 | \$9,981 | \$5,257 | 107 | \$15,345 |
| 2027 | \$14,787 | \$7,715 | \$0 | \$22,502 | \$0 | \$0 | 22502 | \$9,929 | \$5,257 | 107 | \$15,292 |
| 2028 | \$14,983 | \$7,715 | \$0 | \$22,679 | \$0 | \$0 | 22679 | \$9,896 | \$5,257 | 107 | \$15,259 |
| 2029 | \$15,052 | \$7,715 | \$0 | \$22,767 | \$0 | \$0 | 22767 | \$10,014 | \$5,257 | 107 | \$15,289 |
| 2030 | \$14,796 | \$7,715 | \$0 | \$22,512 | \$0 | \$0 | 22512 | \$10,073 | \$5,257 | 107 | \$15,437 |
| 2031 | \$15,759 | \$7,715 | \$0 | \$23,474 | \$0 | \$0 | 23474 | \$9,902 | \$5,257 | 107 | \$15,437 |
| 2032 | \$15,660 | \$7,715 | \$0 | \$23,376 | \$0 | \$0 | 23376 | \$10,546 | \$5,257 | 107 | \$15,266 |
| 2033 | \$15,336 | \$7,715 | \$0 | \$23,052 | \$0 | \$0 | 23052 | \$10,481 | \$5,257 | 107 | \$15,910 |
| 2034 | \$15,130 | \$7,715 | \$0 | \$22,845 | \$0 | \$0 | 22845 | \$10,264 | \$5,257 | 107 | \$15,844 |
| 2035 | \$15,120 | \$7,715 | \$0 | \$22,836 | \$0 | \$0 | 22836 | \$10,126 | \$5,257 | 107 | \$15,627 |
| 2036 | \$14,796 | \$2,932 | \$0 | \$17,728 | \$0 | \$0 | 17728 | \$10,119 | \$5,257 | 107 | \$15,483 |
| 2037 | \$15,061 | \$1,408 | \$0 | \$16,469 | \$0 | \$0 | 16469 | \$9,902 | \$12,007 | 107 | \$15,483 |
| 2038 | \$14,796 | \$0 | \$0 | \$14,796 | \$0 | \$0 | 14796 | \$10,980 | \$959 | 107 | \$12,007 |
| 2039 | \$14,787 | \$0 | \$0 | \$14,787 | \$0 | \$0 | 14787 | \$9,902 | \$0 | 107 | \$11,146 |
| 2040 | \$4,212 | \$0 | \$0 | \$4,212 | \$0 | \$0 | 4212 | \$9,896 | \$0 | 107 | \$10,009 |
| 2041 | \$3,868 | \$0 | \$0 | \$3,868 | \$0 | \$0 | 3868 | \$2,819 | \$0 | 107 | \$10,003 |
| 2042 | \$4,055 | \$0 | \$0 | \$4,055 | \$0 | \$0 | 4055 | \$2,589 | \$0 | 107 | \$12,926 |
| 2043 | \$3,967 | \$0 | \$0 | \$3,967 | \$0 | \$0 | 3967 | \$2,714 | \$0 | 107 | \$2,696 |
| 2044 | \$5,930 | \$0 | \$0 | \$5,930 | \$0 | \$0 | 5930 | \$2,655 | \$0 | 107 | \$2,921 |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$3,969 | \$0 | 0 | \$2,761 |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$4,076 |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$107 |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$107 |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | \$0 | 0 | \$107 |

Case 3

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|------|-----------|-----------|-----|-----------|---------|-----------|-----------|-----------|----------|---------|---------|-----------|--------|-----------|-----|-----|-----|-----|-------|-----|-------|--------|-----------|
| 2108 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$107 | 107 | \$107 | 19,752 | \$190,783 |
| 2109 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$107 | 107 | \$107 | | \$0 |
| 2110 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 0 | \$0 |
| 2111 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2112 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2113 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2114 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2115 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2116 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2117 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2118 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2119 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| 2120 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | 0 | \$0 | 1,796 | \$17,344 |
| | \$431,234 | \$174,076 | \$0 | \$605,310 | \$2,032 | \$603,278 | \$288,603 | \$118,606 | \$10,144 | \$3,310 | \$6,834 | \$417,353 | 19,752 | \$190,783 | | | | | | | | | |

Case 3

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|------|----------|-----|-----|-------|-------|---------|-----|------|------|-----------|----------|-----------|-----------|----------|-------------|
| 2003 | \$5,512 | \$0 | \$0 | \$512 | 0 | \$1,417 | \$0 | 1417 | 0 | \$2,821 | \$0 | 2821 | 0 | \$9,549 | |
| 2004 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2005 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2006 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2007 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2008 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2009 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2010 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2011 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2012 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2013 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2104 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2105 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2106 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2107 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2108 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2109 | \$5,512 | \$0 | \$0 | 5512 | 0 | 1417 | \$0 | 1417 | 0 | 2821 | \$0 | 2821 | 0 | \$9,549 | |
| 2110 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2111 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2112 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2113 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2114 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2115 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2116 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2117 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2118 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2119 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| 2120 | \$10,346 | \$0 | \$0 | 0 | 10346 | \$9,348 | \$0 | 0 | 9348 | \$2,102 | \$0 | 2102 | 2102 | \$21,796 | |
| | | | | | | | | | | \$431,414 | \$15,900 | \$224,674 | \$167,714 | \$23,126 | \$2,335,939 |

Case 3

| YEAR | TOTAL COST | | Total Cost in Millions | CNSTRCT PHASE | TOTAL COST | | |
|------|------------|----------|------------------------------|------------------|------------------|------------------|--------------|
| | (\$000) | ----- | | | EMPLCMT PHASE | CARETKR PHASE | C&D PHASE |
| 1997 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 1998 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 1999 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2000 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2001 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2002 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2003 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2004 | \$0 | \$0.00 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2005 | \$44,263 | \$44.26 | \$44.26 | \$44,263 | 0 | 0 | 0 |
| 2006 | \$48,775 | \$48.77 | \$48.77 | \$48,775 | 0 | 0 | 0 |
| 2007 | \$49,666 | \$49.67 | \$49.67 | \$49,666 | 0 | 0 | 0 |
| 2008 | \$49,679 | \$49.68 | \$49.68 | \$49,679 | 0 | 0 | 0 |
| 2009 | \$54,559 | \$54.56 | \$54.56 | \$54,559 | 0 | 0 | 0 |
| 2010 | \$54,051 | \$54.05 | \$54.05 | \$0 | 54051 | 0 | 0 |
| 2011 | \$63,984 | \$63.98 | \$63.98 | \$0 | 63984 | 0 | 0 |
| 2012 | \$79,086 | \$79.09 | \$79.09 | \$0 | 79086 | 0 | 0 |
| 2013 | \$85,478 | \$85.48 | \$85.48 | \$0 | 85478 | 0 | 0 |
| 2014 | \$102,458 | \$102.46 | \$102.46 | \$0 | 102458 | 0 | 0 |
| 2015 | \$111,358 | \$111.36 | \$111.36 | \$0 | 111358 | 0 | 0 |
| 2016 | \$112,598 | \$112.60 | \$112.60 | \$0 | 112598 | 0 | 0 |
| 2017 | \$112,361 | \$112.36 | \$112.36 | \$0 | 112361 | 0 | 0 |
| 2018 | \$112,075 | \$112.07 | \$112.07 | \$0 | 112075 | 0 | 0 |

Case 3

| | | | | | | |
|------|-----------|----------|-----|--------|---|---|
| 2019 | \$113,187 | \$113.19 | \$0 | 113187 | 0 | 0 |
| 2020 | \$111,995 | \$112.00 | \$0 | 111995 | 0 | 0 |
| 2021 | \$113,134 | \$113.13 | \$0 | 113134 | 0 | 0 |
| 2022 | \$113,192 | \$113.19 | \$0 | 113192 | 0 | 0 |
| 2023 | \$113,352 | \$113.35 | \$0 | 113352 | 0 | 0 |
| 2024 | \$113,654 | \$113.65 | \$0 | 113654 | 0 | 0 |
| 2025 | \$106,393 | \$106.39 | \$0 | 106393 | 0 | 0 |
| 2026 | \$106,715 | \$106.72 | \$0 | 106715 | 0 | 0 |
| 2027 | \$106,724 | \$106.72 | \$0 | 106724 | 0 | 0 |
| 2028 | \$106,275 | \$106.27 | \$0 | 106275 | 0 | 0 |
| 2029 | \$109,162 | \$109.16 | \$0 | 109162 | 0 | 0 |
| 2030 | \$109,054 | \$109.05 | \$0 | 109054 | 0 | 0 |
| 2031 | \$112,525 | \$112.52 | \$0 | 112525 | 0 | 0 |
| 2032 | \$116,050 | \$116.05 | \$0 | 116050 | 0 | 0 |
| 2033 | \$115,333 | \$115.33 | \$0 | 115333 | 0 | 0 |
| 2034 | \$114,416 | \$114.42 | \$0 | 114416 | 0 | 0 |
| 2035 | \$114,468 | \$114.47 | \$0 | 114468 | 0 | 0 |
| 2036 | \$109,223 | \$109.22 | \$0 | 109223 | 0 | 0 |
| 2037 | \$88,212 | \$88.21 | \$0 | 88212 | 0 | 0 |
| 2038 | \$70,496 | \$70.50 | \$0 | 70496 | 0 | 0 |
| 2039 | \$66,386 | \$66.39 | \$0 | 66386 | 0 | 0 |
| 2040 | \$60,070 | \$60.07 | \$0 | 60070 | 0 | 0 |
| 2041 | \$48,971 | \$48.97 | \$0 | 48971 | 0 | 0 |
| 2042 | \$58,968 | \$58.97 | \$0 | 58968 | 0 | 0 |
| 2043 | \$48,194 | \$48.19 | \$0 | 48194 | 0 | 0 |
| 2044 | \$50,098 | \$50.10 | \$0 | 50098 | 0 | 0 |
| 2045 | \$45,482 | \$45.48 | \$0 | 45482 | 0 | 0 |

Case 3

| | | | | | | |
|------|----------|---------|-----|---|-------|---|
| 2046 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2047 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2048 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2049 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2050 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2051 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2052 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2053 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2054 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2055 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2056 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2057 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2058 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2059 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2060 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2061 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2062 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2063 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2064 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2065 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2066 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2067 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2068 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2069 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2070 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2071 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2072 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |

Case 3

| | | | | | | |
|------|----------|---------|-----|---|-------|---|
| 2073 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2074 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2075 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2076 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2077 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2078 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2079 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2080 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2081 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2082 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2083 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2084 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2085 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2086 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2087 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2088 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2089 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2090 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2091 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2092 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2093 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2094 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2095 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2096 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2097 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2098 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2099 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |

Case 3

| | | | | | | |
|------|--------------------|-------------------|------------------|--------------------|------------------|------------------|
| 2100 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2101 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2102 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2103 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2104 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2105 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2106 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2107 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2108 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2109 | \$11,876 | \$11.88 | \$0 | 0 | 11876 | 0 |
| 2110 | \$41,035 | \$41.04 | \$0 | 0 | 11876 | 0 |
| 2111 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2112 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2113 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2114 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2115 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2116 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2117 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2118 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2119 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| 2120 | \$41,035 | \$41.04 | \$0 | 0 | 0 | 41035 |
| | \$4,833,580 | \$4,833.58 | \$246,941 | \$3,375,180 | \$760,071 | \$451,387 |

Case 3

AVERAGE DAILY STAFFING

| YEAR | Excav. | Excav. Mat.Hand. | Gen. Maint. | Borehole Develop. | Emplacem | Backfill | UG Svc. Sys. | TOTAL |
|------|--------|---------------------|----------------|----------------------|----------|----------|-----------------|-------|
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 74 | 0 | 21 | 0 | 0 | 0 | 239 | 334 |
| 2006 | 96 | 0 | 21 | 0 | 0 | 0 | 239 | 356 |
| 2007 | 100 | 0 | 21 | 0 | 0 | 0 | 239 | 360 |
| 2008 | 100 | 0 | 21 | 0 | 0 | 0 | 239 | 360 |
| 2009 | 114 | 0 | 21 | 7 | 0 | 0 | 239 | 380 |
| 2010 | 75 | 0 | 21 | 6 | 2 | 0 | 239 | 343 |
| 2011 | 151 | 0 | 21 | 8 | 1 | 0 | 239 | 421 |
| 2012 | 251 | 0 | 21 | 15 | 2 | 0 | 239 | 529 |
| 2013 | 256 | 0 | 21 | 30 | 4 | 0 | 239 | 550 |
| 2014 | 260 | 0 | 21 | 77 | 7 | 0 | 239 | 604 |
| 2015 | 257 | 0 | 21 | 77 | 18 | 0 | 239 | 612 |
| 2016 | 265 | 0 | 21 | 77 | 18 | 0 | 239 | 621 |
| 2017 | 265 | 0 | 21 | 76 | 19 | 0 | 239 | 620 |
| 2018 | 261 | 0 | 21 | 78 | 18 | 0 | 239 | 617 |

Case 3

| | | | | | | | | |
|------|-----|---|----|----|----|---|-----|-----|
| 2019 | 269 | 0 | 21 | 77 | 19 | 0 | 239 | 625 |
| 2020 | 261 | 0 | 21 | 77 | 19 | 0 | 239 | 616 |
| 2021 | 268 | 0 | 21 | 78 | 18 | 0 | 239 | 625 |
| 2022 | 270 | 0 | 21 | 77 | 19 | 0 | 239 | 625 |
| 2023 | 271 | 0 | 21 | 78 | 18 | 0 | 239 | 627 |
| 2024 | 272 | 0 | 21 | 78 | 19 | 0 | 239 | 628 |
| 2025 | 215 | 0 | 21 | 77 | 19 | 0 | 239 | 571 |
| 2026 | 219 | 0 | 21 | 77 | 19 | 0 | 239 | 574 |
| 2027 | 219 | 0 | 21 | 77 | 18 | 0 | 239 | 575 |
| 2028 | 215 | 0 | 21 | 77 | 18 | 0 | 239 | 571 |
| 2029 | 236 | 0 | 21 | 78 | 19 | 0 | 239 | 592 |
| 2030 | 237 | 0 | 21 | 77 | 19 | 0 | 239 | 592 |
| 2031 | 258 | 0 | 21 | 80 | 18 | 0 | 239 | 617 |
| 2032 | 282 | 0 | 21 | 80 | 19 | 0 | 239 | 641 |
| 2033 | 279 | 0 | 21 | 79 | 19 | 0 | 239 | 637 |
| 2034 | 275 | 0 | 21 | 78 | 19 | 0 | 239 | 632 |
| 2035 | 277 | 0 | 21 | 78 | 19 | 0 | 239 | 634 |
| 2036 | 276 | 0 | 21 | 60 | 19 | 0 | 239 | 615 |
| 2037 | 146 | 0 | 21 | 56 | 14 | 0 | 239 | 477 |
| 2038 | 25 | 0 | 21 | 50 | 13 | 0 | 239 | 349 |
| 2039 | 1 | 0 | 21 | 50 | 12 | 0 | 239 | 324 |
| 2040 | 35 | 0 | 21 | 14 | 12 | 0 | 239 | 322 |
| 2041 | 6 | 0 | 21 | 13 | 3 | 0 | 239 | 283 |
| 2042 | 86 | 0 | 21 | 14 | 3 | 0 | 239 | 363 |
| 2043 | 0 | 0 | 21 | 13 | 3 | 0 | 239 | 277 |
| 2044 | 0 | 0 | 21 | 20 | 3 | 0 | 239 | 283 |
| 2045 | 0 | 0 | 21 | 0 | 5 | 0 | 239 | 265 |

Case 3

| | | | | | | | | | | | |
|------|---|---|---|----|---|---|---|---|---|----|----|
| 2046 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2047 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2048 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2049 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2050 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2051 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2052 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2053 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2054 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2055 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2056 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2057 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2058 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2059 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2060 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2061 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2062 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2063 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2064 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2065 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2066 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2067 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2068 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2069 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2070 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2071 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2072 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |

Case 3

| | | | | | | | | |
|------|---|---|----|---|---|---|----|----|
| 2073 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2074 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2075 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2076 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2077 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2078 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2079 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2080 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2081 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2082 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2083 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2084 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2085 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2086 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2087 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2088 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2089 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2090 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2091 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2092 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2093 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2094 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2095 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2096 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2097 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2098 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |
| 2099 | 0 | 0 | 21 | 0 | 0 | 0 | 56 | 77 |

Case 3

| | | | | | | | | | | | | | |
|------|------|---|------|------|-----|-----|-------|-------|---|----|---|----|----|
| 2100 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2101 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2102 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2103 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2104 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2105 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2106 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2107 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2108 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2109 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| 2120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 |
| | 7426 | 0 | 2205 | 2066 | 496 | 533 | 13383 | 26108 | | | | | |

Case 3

| Project Phase | TOTAL COST |
|----------------------|-----------------------|
| -Construction | \$246,941 |
| -Emplacement | \$3,375,180 |
| -Caretaker | \$760,071 |
| -Closure | \$451,387 |
| | \$4,833,580 |

CASE 4

**UNDERGROUND COST FOR THE ALTERNATIVE CONCEPT EVALUATED AT 73
YEARS**

SPREADSHEET
INPUT
VALUES

| EXCAVATION: | | | | | | | | | |
|-----------------------|-----------------|---------|------------|-----------------|-----------------|--------|------------|-----------------|---------|
| -Common Areas | -Year- | -Tons- | -Tons/Pkg. | -Unit Cost/Tn.- | -Unit Cost/Tn.- | -Tons- | -Tons/Pkg. | -Unit Cost/Tn.- | Const. |
| | 2005 | 60,000 | | | | | | | \$52.75 |
| | 2006 | 60,000 | | | | | | | \$52.75 |
| | 2007 | 60,000 | | | | | | | \$52.75 |
| | 2008 | 60,000 | | | | | | | \$52.75 |
| | 2009 | 60,000 | | | | | | | \$52.75 |
| | 2010 | 0 | | | | | | | \$52.75 |
| EMPLACEMENT COST/PKG: | | | | | | | | | |
| | -SF Pkgs. | \$7,557 | | | | | | | |
| | -DHLW | \$7,557 | | | | | | | |
| | -Other | \$0 | | | | | | | |
| BACKFILL: | | | | | | | | | |
| | -Comp. Fact. | 0.76 | | | | | | | |
| | -Unit Cost/Tn.- | | | | | | | | \$9.66 |

Case 4 Input Values (Cont.)

| EXCAVATED MATERIAL HANDLING: | | GENERAL MAINTENANCE COST: | | BOREHOLE DEVELOPMENT COST | |
|---|--------------|---------------------------|-----------------|---------------------------|----------|
| Emplac | Unit Cost/Tn | Cost/Ton | Cost/Yr (\$000) | -Unit Cost/Hole | |
| \$32 84 | -Const. | \$0 | \$2,485 | | \$0 00 |
| \$32 84 | -Emplac | \$0 | \$4,208 | Spent Fuel | \$0 00 |
| \$32 84 | -Closure | \$0 | \$2,442 | DHLW | \$0 00 |
| \$32 84 | | \$0 | \$2,064 | Other | \$0 00 |
| UNDERGROUND SERVICE SYS(\$000/Year): | | | | | |
| -Backfill Years- | | Construc. | Emplac. | Caretaker | Closure |
| 2110 | | \$22,036 | \$32,322 | \$6,063 | \$10,348 |
| | 2120 | \$3,466 | \$2,152 | \$1,559 | \$9,348 |
| | | \$3,498 | \$6,865 | \$2,863 | \$2,102 |
| | | | | | |

Case 4 Input Values (Cont.)

| PRODUCTIVITY FACTORS | Units | Units per Man Year | Fixed Staff/Year | PERFORMANCE CONFIRMATION |
|----------------------|-----------|--------------------|------------------|--------------------------|
| Variable- | | | | |
| -Excav. | Tons | 3500.00 | 0 | |
| -Mat. Hand. | Tons | 0.00 | 0 | |
| -Bore. Dev. | Boreholes | 0.00 | 0 | 128 |
| -Emplac. | Packages | 125.00 | 0 | |
| -Backfill | Tons | 37040.00 | 0 | (000) PER YR |
| Fixed- | | | | |
| -Gen. Maint. | Tons | 0 | 21 | |
| -UG Svc. Sys. | Tons | 0 | 239 | |

| YEAR | WASTE PACKAGE QUANTITIES | | | | | EXCAVATION TONNAGE(000) | | | | | | | | |
|------|--------------------------|-----|--------|------|-------|-------------------------|---------------------------|--------|-----------------|---------|----------|---------------------------|-------|-------|
| | Intact | Mix | Hdwre. | DHLW | Other | Total | Mining Ratio Intact | Mix | Common Areas | Sm. MPC | Lge. MPC | Emplacement Areas DHLW | Other | Total |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 0 | 200 | 0 | 0 | 260 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 29 | 275 | 0 | 0 | 335 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 31 | 275 | 0 | 0 | 364 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 60 | 101 | 275 | 0 | 0 | 366 |
| 2010 | 11 | 44 | 0 | 0 | 0 | 55 | 100.0% | 100.0% | 0 | 177 | 202 | 0 | 0 | 379 |
| 2011 | 11 | 39 | 0 | 0 | 0 | 50 | 100.0% | 100.0% | 0 | 145 | 517 | 0 | 0 | 662 |
| 2012 | 37 | 33 | 0 | 0 | 0 | 70 | 100.0% | 100.0% | 0 | 52 | 953 | 0 | 0 | 1,005 |
| 2013 | 65 | 74 | 0 | 0 | 0 | 139 | 100.0% | 100.0% | 0 | 146 | 892 | 0 | 0 | 1,038 |
| 2014 | 53 | 190 | 0 | 0 | 0 | 243 | 100.0% | 100.0% | 0 | 184 | 0 | 0 | 0 | 1,065 |
| 2015 | 19 | 350 | 0 | 200 | 0 | 569 | 100.0% | 100.0% | 0 | 32 | 966 | 0 | 0 | 998 |
| 2016 | 54 | 328 | 0 | 200 | 0 | 582 | 100.0% | 100.0% | 0 | 246 | 833 | 0 | 0 | 1,078 |
| 2017 | 68 | 324 | 0 | 200 | 0 | 591 | 100.0% | 100.0% | 0 | 138 | 907 | 0 | 0 | 1,045 |
| 2018 | 12 | 355 | 0 | 200 | 0 | 567 | 100.0% | 100.0% | 0 | 122 | 921 | 0 | 0 | 1,044 |
| 2019 | 90 | 308 | 0 | 200 | 0 | 598 | 100.0% | 100.0% | 0 | 91 | 953 | 0 | 0 | 1,044 |
| 2020 | 51 | 333 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 0 | 54 | 952 | 0 | 0 | 1,005 |
| 2021 | 45 | 339 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 0 | 200 | 862 | 0 | 0 | 1,062 |
| 2022 | 33 | 350 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 0 | 183 | 878 | 0 | 0 | 1,061 |
| 2023 | 20 | 350 | 0 | 200 | 0 | 569 | 100.0% | 100.0% | 0 | 153 | 892 | 0 | 0 | 1,045 |
| 2024 | 73 | 317 | 0 | 200 | 0 | 590 | 100.0% | 100.0% | 0 | 286 | 832 | 0 | 0 | 1,118 |
| 2025 | 67 | 323 | 0 | 200 | 0 | 590 | 100.0% | 100.0% | 0 | 14 | 985 | 0 | 0 | 999 |
| 2026 | 56 | 328 | 0 | 200 | 0 | 584 | 100.0% | 100.0% | 0 | 91 | 946 | 0 | 0 | 1,038 |
| 2027 | 105 | 306 | 0 | 200 | 0 | 611 | 100.0% | 100.0% | 0 | 243 | 836 | 0 | 0 | 1,079 |
| 2028 | 5 | 362 | 0 | 200 | 0 | 567 | 100.0% | 100.0% | 0 | 220 | 868 | 0 | 0 | 1,088 |
| 2029 | 34 | 348 | 0 | 200 | 0 | 581 | 100.0% | 100.0% | 0 | 629 | 602 | 0 | 0 | 1,231 |
| 2030 | 89 | 307 | 0 | 200 | 0 | 597 | 100.0% | 100.0% | 0 | 395 | 766 | 0 | 0 | 1,161 |
| 2031 | 81 | 319 | 0 | 200 | 0 | 600 | 100.0% | 100.0% | 0 | 172 | 907 | 0 | 0 | 1,079 |
| 2032 | 231 | 221 | 0 | 200 | 0 | 653 | 100.0% | 100.0% | 0 | 17 | 1,008 | 0 | 0 | 1,025 |
| 2033 | 145 | 281 | 0 | 200 | 0 | 627 | 100.0% | 100.0% | 0 | 83 | 958 | 0 | 0 | 1,040 |
| 2034 | 63 | 333 | 0 | 200 | 0 | 597 | 100.0% | 100.0% | 0 | 130 | 914 | 0 | 0 | 1,044 |
| 2035 | 6 | 371 | 0 | 200 | 0 | 577 | 100.0% | 100.0% | 0 | 123 | 924 | 0 | 0 | 1,047 |
| 2036 | 30 | 352 | 0 | 200 | 0 | 582 | 100.0% | 100.0% | 0 | 290 | 784 | 0 | 0 | 1,075 |
| 2037 | 48 | 336 | 0 | 76 | 0 | 460 | 100.0% | 100.0% | 0 | 98 | 932 | 0 | 0 | 1,030 |
| 2038 | 45 | 340 | 0 | 37 | 0 | 422 | 100.0% | 100.0% | 0 | 132 | 190 | 0 | 0 | 322 |
| 2039 | 107 | 288 | 0 | 0 | 0 | 395 | 100.0% | 100.0% | 0 | 10 | 254 | 0 | 0 | 265 |
| 2040 | 36 | 342 | 0 | 0 | 0 | 378 | 100.0% | 100.0% | 0 | 186 | 137 | 0 | 0 | 323 |
| 2041 | 49 | 70 | 0 | 0 | 0 | 118 | 100.0% | 100.0% | 0 | 32 | 244 | 0 | 0 | 276 |

| YEAR | EXCAVATION COST(\$000) | | | DHLW Areas | Other | TOTAL EXCAVATION COST | EXCAVATED MATERIAL HAND. COST (\$000) | CNSTRCT PHASE | EMPLCMT PHASE | GENERAL MAINTENANCE COST (\$000) | CNSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | C&D PHASE |
|------|------------------------|------------------|----------|------------|-------|-----------------------|---------------------------------------|---------------|---------------|----------------------------------|---------------|---------------|---------------|-----------|
| | Common Areas | Spent Fuel Areas | PHASE | | | | | | | | | | | |
| 1997 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 1998 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 1999 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 2000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 2001 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 2002 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 2003 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 2004 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | | | | | | |
| 2005 | \$3,165 | \$10,551 | \$10,551 | \$0 | \$0 | \$13,716 | \$1,924 | | | \$2,485 | | | | |
| 2006 | \$3,165 | \$14,507 | \$14,507 | \$0 | \$0 | \$17,673 | \$2,479 | | | \$2,485 | | | | |
| 2007 | \$3,165 | \$18,062 | \$18,062 | \$0 | \$0 | \$19,228 | \$2,697 | | | \$2,485 | | | | |
| 2008 | \$3,165 | \$16,122 | \$16,122 | \$0 | \$0 | \$19,288 | \$2,706 | | | \$2,485 | | | | |
| 2009 | \$3,165 | \$19,819 | \$19,819 | \$0 | \$0 | \$22,984 | \$3,224 | | | \$2,485 | | | | |
| 2010 | \$0 | \$12,450 | \$12,450 | \$0 | \$0 | \$12,450 | \$1,135 | | 1135 | \$4,208 | | 4208 | | |
| 2011 | \$0 | \$21,738 | \$21,738 | \$0 | \$0 | \$21,738 | \$1,982 | | 1982 | \$4,208 | | 4208 | | |
| 2012 | \$0 | \$32,983 | \$32,983 | \$0 | \$0 | \$32,983 | \$3,008 | | 3008 | \$4,208 | | 4208 | | |
| 2013 | \$0 | \$34,095 | \$34,095 | \$0 | \$0 | \$34,095 | \$3,109 | | 3109 | \$4,208 | | 4208 | | |
| 2014 | \$0 | \$34,962 | \$34,962 | \$0 | \$0 | \$34,962 | \$3,188 | | 3188 | \$4,208 | | 4208 | | |
| 2015 | \$0 | \$32,772 | \$32,772 | \$0 | \$0 | \$32,772 | \$2,988 | | 2988 | \$4,208 | | 4208 | | |
| 2016 | \$0 | \$35,418 | \$35,418 | \$0 | \$0 | \$35,418 | \$3,229 | | 3229 | \$4,208 | | 4208 | | |
| 2017 | \$0 | \$34,304 | \$34,304 | \$0 | \$0 | \$34,304 | \$3,128 | | 3128 | \$4,208 | | 4208 | | |
| 2018 | \$0 | \$34,275 | \$34,275 | \$0 | \$0 | \$34,275 | \$3,125 | | 3125 | \$4,208 | | 4208 | | |
| 2019 | \$0 | \$34,274 | \$34,274 | \$0 | \$0 | \$34,274 | \$3,125 | | 3125 | \$4,208 | | 4208 | | |
| 2020 | \$0 | \$33,010 | \$33,010 | \$0 | \$0 | \$33,010 | \$3,010 | | 3010 | \$4,208 | | 4208 | | |
| 2021 | \$0 | \$34,878 | \$34,878 | \$0 | \$0 | \$34,878 | \$3,180 | | 3180 | \$4,208 | | 4208 | | |
| 2022 | \$0 | \$34,839 | \$34,839 | \$0 | \$0 | \$34,839 | \$3,177 | | 3177 | \$4,208 | | 4208 | | |
| 2023 | \$0 | \$34,333 | \$34,333 | \$0 | \$0 | \$34,333 | \$3,131 | | 3131 | \$4,208 | | 4208 | | |
| 2024 | \$0 | \$36,707 | \$36,707 | \$0 | \$0 | \$36,707 | \$3,347 | | 3347 | \$4,208 | | 4208 | | |
| 2025 | \$0 | \$32,806 | \$32,806 | \$0 | \$0 | \$32,806 | \$2,991 | | 2991 | \$4,208 | | 4208 | | |
| 2026 | \$0 | \$34,080 | \$34,080 | \$0 | \$0 | \$34,080 | \$3,107 | | 3107 | \$4,208 | | 4208 | | |
| 2027 | \$0 | \$35,437 | \$35,437 | \$0 | \$0 | \$35,437 | \$3,231 | | 3231 | \$4,208 | | 4208 | | |
| 2028 | \$0 | \$35,719 | \$35,719 | \$0 | \$0 | \$35,719 | \$3,257 | | 3257 | \$4,208 | | 4208 | | |
| 2029 | \$0 | \$40,444 | \$40,444 | \$0 | \$0 | \$40,444 | \$3,688 | | 3688 | \$4,208 | | 4208 | | |
| 2030 | \$0 | \$38,141 | \$38,141 | \$0 | \$0 | \$38,141 | \$3,478 | | 3478 | \$4,208 | | 4208 | | |
| 2031 | \$0 | \$35,436 | \$35,436 | \$0 | \$0 | \$35,436 | \$3,231 | | 3231 | \$4,208 | | 4208 | | |
| 2032 | \$0 | \$33,877 | \$33,877 | \$0 | \$0 | \$33,877 | \$3,071 | | 3071 | \$4,208 | | 4208 | | |
| 2033 | \$0 | \$34,158 | \$34,158 | \$0 | \$0 | \$34,158 | \$3,115 | | 3115 | \$4,208 | | 4208 | | |
| 2034 | \$0 | \$34,282 | \$34,282 | \$0 | \$0 | \$34,282 | \$3,126 | | 3126 | \$4,208 | | 4208 | | |
| 2035 | \$0 | \$34,392 | \$34,392 | \$0 | \$0 | \$34,392 | \$3,136 | | 3136 | \$4,208 | | 4208 | | |
| 2036 | \$0 | \$35,293 | \$35,293 | \$0 | \$0 | \$35,293 | \$3,218 | | 3218 | \$4,208 | | 4208 | | |
| 2037 | \$0 | \$33,818 | \$33,818 | \$0 | \$0 | \$33,818 | \$3,084 | | 3084 | \$4,208 | | 4208 | | |
| 2038 | \$0 | \$10,570 | \$10,570 | \$0 | \$0 | \$10,570 | \$964 | | 964 | \$4,208 | | 4208 | | |
| 2039 | \$0 | \$8,691 | \$8,691 | \$0 | \$0 | \$8,691 | \$792 | | 792 | \$4,208 | | 4208 | | |
| 2040 | \$0 | \$10,621 | \$10,621 | \$0 | \$0 | \$10,621 | \$968 | | 968 | \$4,208 | | 4208 | | |
| 2041 | \$0 | \$9,051 | \$9,051 | \$0 | \$0 | \$9,051 | \$825 | | 825 | \$4,208 | | 4208 | | |
| 2042 | \$0 | \$17,312 | \$17,312 | \$0 | \$0 | \$17,312 | \$1,579 | | 1579 | \$4,208 | | 4208 | | |
| 2043 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2044 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2045 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2046 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2047 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2048 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2049 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| 2050 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | | 0 | \$4,208 | | 4208 | | |
| | | | | | | | | | | | | | | 2442 |
| | | | | | | | | | | | | | | 2442 |
| | | | | | | | | | | | | | | 2442 |
| | | | | | | | | | | | | | | 2442 |

| YEAR | BOREHOLE DEV COST (\$000) | | | EMPLACEMENT COST(\$000) | | | BACKFILL-DEV AREAS | | | | | | | |
|------|---------------------------|------|-------|-------------------------|----------------|---------------|--------------------|---------|----------------------------------|----------------|---------------|---------|------------|--------------|
| | SF Pkgs | DHLW | Other | Total | CHNSTRCT PHASE | EMPLCMN PHASE | SF Pkgs | DHLW/dw | Performance Confirmation Removal | EMPLCMNT PHASE | CARETKR PHASE | Total | Tons (000) | COST (\$000) |
| 1997 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 1998 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 1999 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2000 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2001 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2002 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2003 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2004 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2005 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2006 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2007 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2008 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2009 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2010 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2011 | \$0 | \$0 | \$0 | \$0 | | | \$414 | \$0 | \$0 | | | \$414 | 0 | \$0 |
| 2012 | \$0 | \$0 | \$0 | \$0 | | | \$377 | \$0 | \$0 | | | \$377 | 0 | \$0 |
| 2013 | \$0 | \$0 | \$0 | \$0 | | | \$527 | \$0 | \$0 | | | \$527 | 0 | \$0 |
| 2014 | \$0 | \$0 | \$0 | \$0 | | | \$1,053 | \$0 | \$0 | | | \$1,053 | 0 | \$0 |
| 2015 | \$0 | \$0 | \$0 | \$0 | | | \$1,838 | \$0 | \$0 | | | \$1,838 | 0 | \$0 |
| 2016 | \$0 | \$0 | \$0 | \$0 | | | \$2,790 | \$1,511 | \$0 | | | \$4,301 | 0 | \$0 |
| 2017 | \$0 | \$0 | \$0 | \$0 | | | \$2,883 | \$1,511 | \$0 | | | \$4,394 | 0 | \$0 |
| 2018 | \$0 | \$0 | \$0 | \$0 | | | \$2,956 | \$1,511 | \$0 | | | \$4,468 | 0 | \$0 |
| 2019 | \$0 | \$0 | \$0 | \$0 | | | \$2,771 | \$1,511 | \$0 | | | \$4,283 | 0 | \$0 |
| 2020 | \$0 | \$0 | \$0 | \$0 | | | \$2,995 | \$1,511 | \$0 | | | \$4,506 | 0 | \$0 |
| 2021 | \$0 | \$0 | \$0 | \$0 | | | \$2,901 | \$1,511 | \$128 | 128 | | \$4,540 | 0 | \$0 |
| 2022 | \$0 | \$0 | \$0 | \$0 | | | \$2,898 | \$1,511 | \$0 | | | \$4,410 | 0 | \$0 |
| 2023 | \$0 | \$0 | \$0 | \$0 | | | \$2,791 | \$1,511 | \$0 | | | \$4,303 | 0 | \$0 |
| 2024 | \$0 | \$0 | \$0 | \$0 | | | \$2,949 | \$1,511 | \$0 | | | \$4,460 | 0 | \$0 |
| 2025 | \$0 | \$0 | \$0 | \$0 | | | \$2,946 | \$1,511 | \$0 | | | \$4,457 | 0 | \$0 |
| 2026 | \$0 | \$0 | \$0 | \$0 | | | \$2,903 | \$1,511 | \$0 | | | \$4,414 | 0 | \$0 |
| 2027 | \$0 | \$0 | \$0 | \$0 | | | \$3,104 | \$1,511 | \$0 | | | \$4,615 | 0 | \$0 |
| 2028 | \$0 | \$0 | \$0 | \$0 | | | \$2,774 | \$1,511 | \$0 | | | \$4,285 | 0 | \$0 |
| 2029 | \$0 | \$0 | \$0 | \$0 | | | \$2,882 | \$1,511 | \$0 | | | \$4,393 | 0 | \$0 |
| 2030 | \$0 | \$0 | \$0 | \$0 | | | \$2,997 | \$1,511 | \$128 | 128 | | \$4,636 | 0 | \$0 |
| 2031 | \$0 | \$0 | \$0 | \$0 | | | \$3,020 | \$1,511 | \$0 | | | \$4,532 | 0 | \$0 |
| 2032 | \$0 | \$0 | \$0 | \$0 | | | \$3,420 | \$1,511 | \$0 | | | \$4,931 | 0 | \$0 |
| 2033 | \$0 | \$0 | \$0 | \$0 | | | \$3,225 | \$1,511 | \$0 | | | \$4,737 | 0 | \$0 |
| 2034 | \$0 | \$0 | \$0 | \$0 | | | \$2,996 | \$1,511 | \$0 | | | \$4,508 | 0 | \$0 |
| 2035 | \$0 | \$0 | \$0 | \$0 | | | \$2,848 | \$1,511 | \$0 | | | \$4,359 | 0 | \$0 |
| 2036 | \$0 | \$0 | \$0 | \$0 | | | \$2,888 | \$1,511 | \$0 | | | \$4,400 | 0 | \$0 |
| 2037 | \$0 | \$0 | \$0 | \$0 | | | \$2,899 | \$574 | \$0 | | | \$3,473 | 0 | \$0 |
| 2038 | \$0 | \$0 | \$0 | \$0 | | | \$2,908 | \$280 | \$0 | | | \$3,188 | 0 | \$0 |
| 2039 | \$0 | \$0 | \$0 | \$0 | | | \$2,964 | \$0 | \$0 | | | \$2,964 | 0 | \$0 |
| 2040 | \$0 | \$0 | \$0 | \$0 | | | \$2,860 | \$0 | \$128 | 128 | | \$2,988 | 0 | \$0 |
| 2041 | \$0 | \$0 | \$0 | \$0 | | | \$894 | \$0 | \$0 | | | \$894 | 0 | \$0 |
| 2042 | \$0 | \$0 | \$0 | \$0 | | | \$735 | \$0 | \$0 | | | \$735 | 0 | \$0 |
| 2043 | \$0 | \$0 | \$0 | \$0 | | | \$898 | \$0 | \$0 | | | \$898 | 0 | \$0 |
| 2044 | \$0 | \$0 | \$0 | \$0 | | | \$765 | \$0 | \$0 | | | \$765 | 0 | \$0 |
| 2045 | \$0 | \$0 | \$0 | \$0 | | | \$1,464 | \$0 | \$0 | | | \$1,464 | 0 | \$0 |
| 2046 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2047 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2048 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |
| 2049 | \$0 | \$0 | \$0 | \$0 | | | \$0 | \$0 | \$0 | | | \$0 | 0 | \$0 |

UNDERGROUND SERVICE SYSTEMS COST

| YEAR | Support Sys. F.c. | CNSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | CAD PHASE | UR/MS | CNSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | CAD PHASE | Monitoring | CNSTRCT PHASE | EMPLCMT PHASE | CARETRK PHASE | CAD PHASE | Total Sys. Sphl Cost |
|------|----------------------|------------------|------------------|------------------|--------------|-------|------------------|------------------|------------------|--------------|------------|------------------|------------------|------------------|--------------|----------------------------|
| | | | | | | | | | | | | | | | | |
| 1997 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 1998 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 1999 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 2000 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 2001 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 2002 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 2003 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 2004 | | \$0 | | | | 0 | \$0 | | | | 0 | \$0 | | | | \$0 |
| 2005 | \$22.036 | | | | | 0 | \$3,466 | | | | 0 | \$3,466 | | | | \$29,000 |
| 2006 | \$22.036 | | | | | 0 | \$3,466 | | | | 0 | \$3,466 | | | | \$29,000 |
| 2007 | \$22.036 | | | | | 0 | \$3,466 | | | | 0 | \$3,466 | | | | \$29,000 |
| 2008 | \$22.036 | | | | | 0 | \$3,466 | | | | 0 | \$3,466 | | | | \$29,000 |
| 2009 | \$22.036 | | | | | 0 | \$3,466 | | | | 0 | \$3,466 | | | | \$29,000 |
| 2010 | | \$22.036 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2011 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2012 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2013 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2014 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2015 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2016 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2017 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2018 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2019 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2020 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2021 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2022 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2023 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2024 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2025 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2026 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2027 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2028 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2029 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2030 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2031 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2032 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2033 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2034 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2035 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2036 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2037 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2038 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2039 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2040 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2041 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2042 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2043 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2044 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2045 | | \$32.322 | | | | 0 | \$2,152 | | | | 0 | \$2,152 | | | | \$41,339 |
| 2046 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | | 0 | \$2,883 | | | | \$10,504 |
| 2047 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2048 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2049 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2050 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2051 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2052 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2053 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2054 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2055 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2056 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2057 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2058 | \$6.063 | | | | 6063 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$10,504 |
| 2059 | \$10.346 | | | | 10346 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$21,796 |
| 2060 | \$10.346 | | | | 10346 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$21,796 |
| 2061 | \$10.346 | | | | 10346 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$21,796 |
| 2062 | \$10.346 | | | | 10346 | 0 | \$1,559 | | | 1559 | \$2,883 | | | | | \$21,796 |

Case 4

| YEAR | TOTAL COST | | in Millions | CNSTRCT PHASE | TOTAL COST | | | | |
|------|------------|------------|----------------|------------------|-------------------|------------------|--------------|---|---|
| | (\$000) | Total Cost | | | EMPLCMNT PHASE | CARETKR PHASE | C&D PHASE | | |
| 1997 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 1998 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 1999 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 2000 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 2001 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 2002 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 2003 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 2004 | \$0 | \$0.00 | \$0.00 | | \$0 | 0 | 0 | 0 | 0 |
| 2005 | \$47,126 | \$47.13 | \$47.13 | | \$47,126 | 0 | 0 | 0 | 0 |
| 2006 | \$51,637 | \$51.64 | \$51.64 | | \$51,637 | 0 | 0 | 0 | 0 |
| 2007 | \$53,410 | \$53.41 | \$53.41 | | \$53,410 | 0 | 0 | 0 | 0 |
| 2008 | \$53,479 | \$53.48 | \$53.48 | | \$53,479 | 0 | 0 | 0 | 0 |
| 2009 | \$57,693 | \$57.69 | \$57.69 | | \$57,693 | 0 | 0 | 0 | 0 |
| 2010 | \$59,546 | \$59.55 | \$59.55 | | \$0 | 59546 | 0 | 0 | 0 |
| 2011 | \$69,644 | \$69.64 | \$69.64 | | \$0 | 69644 | 0 | 0 | 0 |
| 2012 | \$82,076 | \$82.08 | \$82.08 | | \$0 | 82076 | 0 | 0 | 0 |
| 2013 | \$83,803 | \$83.80 | \$83.80 | | \$0 | 83803 | 0 | 0 | 0 |
| 2014 | \$85,535 | \$85.54 | \$85.54 | | \$0 | 85535 | 0 | 0 | 0 |
| 2015 | \$85,609 | \$85.61 | \$85.61 | | \$0 | 85609 | 0 | 0 | 0 |
| 2016 | \$88,589 | \$88.59 | \$88.59 | | \$0 | 88589 | 0 | 0 | 0 |
| 2017 | \$87,447 | \$87.45 | \$87.45 | | \$0 | 87447 | 0 | 0 | 0 |
| 2018 | \$87,230 | \$87.23 | \$87.23 | | \$0 | 87230 | 0 | 0 | 0 |

Case 4

| | | | | | | |
|------|----------|---------|-----|-------|---|---|
| 2019 | \$87,453 | \$87.45 | \$0 | 87453 | 0 | 0 |
| 2020 | \$86,107 | \$86.11 | \$0 | 86107 | 0 | 0 |
| 2021 | \$88,012 | \$88.01 | \$0 | 88012 | 0 | 0 |
| 2022 | \$87,972 | \$87.97 | \$0 | 87972 | 0 | 0 |
| 2023 | \$87,313 | \$87.31 | \$0 | 87313 | 0 | 0 |
| 2024 | \$90,062 | \$90.06 | \$0 | 90062 | 0 | 0 |
| 2025 | \$85,801 | \$85.80 | \$0 | 85801 | 0 | 0 |
| 2026 | \$87,149 | \$87.15 | \$0 | 87149 | 0 | 0 |
| 2027 | \$88,831 | \$88.83 | \$0 | 88831 | 0 | 0 |
| 2028 | \$88,809 | \$88.81 | \$0 | 88809 | 0 | 0 |
| 2029 | \$94,072 | \$94.07 | \$0 | 94072 | 0 | 0 |
| 2030 | \$91,802 | \$91.80 | \$0 | 91802 | 0 | 0 |
| 2031 | \$88,746 | \$88.75 | \$0 | 88746 | 0 | 0 |
| 2032 | \$87,226 | \$87.23 | \$0 | 87226 | 0 | 0 |
| 2033 | \$87,556 | \$87.56 | \$0 | 87556 | 0 | 0 |
| 2034 | \$87,463 | \$87.46 | \$0 | 87463 | 0 | 0 |
| 2035 | \$87,434 | \$87.43 | \$0 | 87434 | 0 | 0 |
| 2036 | \$88,458 | \$88.46 | \$0 | 88458 | 0 | 0 |
| 2037 | \$85,922 | \$85.92 | \$0 | 85922 | 0 | 0 |
| 2038 | \$60,269 | \$60.27 | \$0 | 60269 | 0 | 0 |
| 2039 | \$58,015 | \$58.01 | \$0 | 58015 | 0 | 0 |
| 2040 | \$60,124 | \$60.12 | \$0 | 60124 | 0 | 0 |
| 2041 | \$56,317 | \$56.32 | \$0 | 56317 | 0 | 0 |
| 2042 | \$65,173 | \$65.17 | \$0 | 65173 | 0 | 0 |
| 2043 | \$46,445 | \$46.45 | \$0 | 46445 | 0 | 0 |
| 2044 | \$46,312 | \$46.31 | \$0 | 46312 | 0 | 0 |
| 2045 | \$47,011 | \$47.01 | \$0 | 47011 | 0 | 0 |

Case 4

| | | | | | | |
|------|----------|---------|-----|---|-------|-------|
| 2046 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2047 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2048 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2049 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2050 | \$13,074 | \$13.07 | \$0 | 0 | 13074 | 0 |
| 2051 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2052 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2053 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2054 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2055 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2056 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2057 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2058 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2059 | \$12,946 | \$12.95 | \$0 | 0 | 12946 | 0 |
| 2060 | \$24,209 | \$24.21 | \$0 | 0 | 0 | 24209 |
| 2061 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2062 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2063 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2064 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2065 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2066 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2067 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2068 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2069 | \$24,081 | \$24.08 | \$0 | 0 | 0 | 24081 |
| 2070 | \$24,209 | \$24.21 | \$0 | 0 | 0 | 24209 |
| 2071 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 |
| 2072 | \$0 | \$0.00 | \$0 | 0 | 0 | 0 |

Case 4

| | | | | | | | |
|------|-----|--------|-----|-----|---|---|---|
| 2073 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2074 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2075 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2076 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2077 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2078 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2079 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2080 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2081 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2082 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2083 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2084 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2085 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2086 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2087 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2088 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2089 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2090 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2091 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2092 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2093 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2094 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2095 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2096 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2097 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2098 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |
| 2099 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 |

Case 4

| | | | | | | | | |
|---|-------------|------------|-----------|-------------|-----------|-----------|---|---|
| 2100 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2101 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2102 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2103 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2104 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2105 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2106 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2107 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2108 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2109 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2110 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2111 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2112 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2113 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2114 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2115 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2116 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2117 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2118 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2119 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| 2120 | \$0 | \$0.00 | \$0 | \$0 | 0 | 0 | 0 | 0 |
| <hr style="border-top: 1px dashed black;"/> | | | | | | | | |
| | \$3,555,202 | \$3,555.20 | \$263,345 | \$2,845,334 | \$181,376 | \$265,148 | | |

Case 4

AVERAGE DAILY STAFFING

| YEAR | Excav. | Excav. Mat.Hand. | Gen. Maint. | Borehole Develop. | Emplacem | Backfill | UG Svc. Sys. | TOTAL |
|------|--------|---------------------|----------------|----------------------|----------|----------|-----------------|-------|
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 74 | 0 | 21 | 0 | 0 | 0 | 239 | 334 |
| 2006 | 96 | 0 | 21 | 0 | 0 | 0 | 239 | 356 |
| 2007 | 104 | 0 | 21 | 0 | 0 | 0 | 239 | 364 |
| 2008 | 104 | 0 | 21 | 0 | 0 | 0 | 239 | 364 |
| 2009 | 124 | 0 | 21 | 0 | 0 | 0 | 239 | 384 |
| 2010 | 108 | 0 | 21 | 0 | 0 | 0 | 239 | 369 |
| 2011 | 189 | 0 | 21 | 0 | 0 | 0 | 239 | 450 |
| 2012 | 287 | 0 | 21 | 0 | 1 | 0 | 239 | 548 |
| 2013 | 297 | 0 | 21 | 0 | 1 | 0 | 239 | 558 |
| 2014 | 304 | 0 | 21 | 0 | 2 | 0 | 239 | 566 |
| 2015 | 285 | 0 | 21 | 0 | 5 | 0 | 239 | 550 |
| 2016 | 308 | 0 | 21 | 0 | 5 | 0 | 239 | 573 |
| 2017 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2018 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |

Case 4

| | | | | | | | | |
|------|-----|---|----|---|---|---|-----|-----|
| 2019 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2020 | 287 | 0 | 21 | 0 | 5 | 0 | 239 | 552 |
| 2021 | 303 | 0 | 21 | 0 | 5 | 0 | 239 | 568 |
| 2022 | 303 | 0 | 21 | 0 | 5 | 0 | 239 | 568 |
| 2023 | 299 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2024 | 319 | 0 | 21 | 0 | 5 | 0 | 239 | 584 |
| 2025 | 285 | 0 | 21 | 0 | 5 | 0 | 239 | 550 |
| 2026 | 296 | 0 | 21 | 0 | 5 | 0 | 239 | 561 |
| 2027 | 308 | 0 | 21 | 0 | 5 | 0 | 239 | 573 |
| 2028 | 311 | 0 | 21 | 0 | 5 | 0 | 239 | 575 |
| 2029 | 352 | 0 | 21 | 0 | 5 | 0 | 239 | 616 |
| 2030 | 332 | 0 | 21 | 0 | 5 | 0 | 239 | 597 |
| 2031 | 308 | 0 | 21 | 0 | 5 | 0 | 239 | 573 |
| 2032 | 293 | 0 | 21 | 0 | 5 | 0 | 239 | 558 |
| 2033 | 297 | 0 | 21 | 0 | 5 | 0 | 239 | 562 |
| 2034 | 298 | 0 | 21 | 0 | 5 | 0 | 239 | 563 |
| 2035 | 299 | 0 | 21 | 0 | 5 | 0 | 239 | 564 |
| 2036 | 307 | 0 | 21 | 0 | 5 | 0 | 239 | 572 |
| 2037 | 294 | 0 | 21 | 0 | 4 | 0 | 239 | 558 |
| 2038 | 92 | 0 | 21 | 0 | 3 | 0 | 239 | 355 |
| 2039 | 76 | 0 | 21 | 0 | 3 | 0 | 239 | 339 |
| 2040 | 92 | 0 | 21 | 0 | 3 | 0 | 239 | 355 |
| 2041 | 79 | 0 | 21 | 0 | 1 | 0 | 239 | 340 |
| 2042 | 151 | 0 | 21 | 0 | 1 | 0 | 239 | 411 |
| 2043 | 0 | 0 | 21 | 0 | 1 | 0 | 239 | 261 |
| 2044 | 0 | 0 | 21 | 0 | 1 | 0 | 239 | 261 |
| 2045 | 0 | 0 | 21 | 0 | 2 | 0 | 239 | 262 |

Case 4

| | | | | | | | | | | |
|------|---|---|----|---|---|---|---|---|----|----|
| 2046 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2047 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2048 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2049 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2050 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2051 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2052 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2053 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2054 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2055 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2056 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2057 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2058 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2059 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 56 | 77 |
| 2060 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2061 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2062 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2063 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2064 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2065 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2066 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2067 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2068 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2069 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2070 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 2071 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2072 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Case 4

| | | | | | | | | | | | | | | | | | | | | | | |
|------|------|---|------|---|-----|---|-------|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2103 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2107 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2108 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2109 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2116 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | |
| | 9159 | 0 | 1386 | 0 | 127 | 6 | 10583 | 21261 | | | | | | | | | | | | | | |

Case 4

| Project Phase | TOTAL COST |
|----------------------|-----------------------|
| -Construction | \$263,345 |
| -Emplacement | \$2,845,334 |
| -Caretaker | \$181,376 |
| -Closure | \$264,892 |
| | \$3,554,946 |