ECE-100BC111-00007
Revision 0

Environmental Cost Estimate for 100-BC-1, 100-BC-2, and 100-BC-5 RI/FS

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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CHPRC Environmental Cost Estimate Cover Page

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Executive Summary

This remedial investigation/feasibility study cost estimate is based on the development of remedial alternatives identified in Chapter 9, Development and Screening of Alternatives of DOE/RL-2010-96, *Remedial Investigation/Feasibility Study for 100-BC-1, 100-BC-2, and 100-BC-5 Operable Unit*. The alternatives were developed to identify a combination of remedial actions to clean up soil within the 100-BC-1 and 100-BC-2 Operable Units (OUs) and groundwater within the 100-BC-5 OU.

Based on technology screening and evaluations, seven alternatives were assembled and selected for evaluation, including the required No Action alternative:

- Alternative 1: No action.
- Alternative 2: Natural Attenuation with Institutional Controls (ICs) and Removal, Treatment, and Disposal (RTD) for Waste Sites; and Monitored Natural Attenuation (MNA) with ICs for Groundwater.
- Alternative 3: Natural Attenuation with ICs and RTD for Waste Sites; and Pump and Treat (P&T) and MNA with ICs for Groundwater.
- Alternative 4: Natural Attenuation with ICs and Aggressive RTD for Waste Sites; and P&T with MNA and ICs for Groundwater.
- Alternative 5: Natural Attenuation with ICs and RTD for Waste Sites; and Hexavalent Chromium (Cr[VI]) Source Treatment with P&T and MNA with ICs for Groundwater.
- Alternative 6: Natural Attenuation with ICs and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs for Groundwater.
- Alternative 7: Natural Attenuation with ICs and Aggressive RTD for Waste Sites; Cr(VI) and Strontium-90 (Sr-90) Source Treatment with P&T, and MNA with ICs for Groundwater.

For Alternatives 2, 3, and 5, RTD is applied to the 100-B-34 dichromate transfer pipeline segment only.

Cost estimates were developed for each of the alternatives using EPA 540-R-00-002, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*; Association for the Advancement of Cost Engineering International cost estimating classification system guidelines (AACE, 2011, *AACE International Recommended Practice 17R-97, Cost Estimate Classification System*); and standard industry practices. The estimates created for this report are considered to be Category 4 with an accuracy range of +50 percent/-30 percent. This environmental cost estimate (ECE) describes this estimate; Appendix A providessummary reports. Table ES-1 provides a summary of the costs for each alternative.

In addition, rough order of magnitude (ROM) costs were developed for deep RTD of 29 waste sites.

Table ES-1. Summary of Cost Estimates for Each Alternative

100-BC-1, 100-BC-2, and 100-BC-5 OUs Cost Estimate Summary by Alternative	Alt 1: No Action	Alt 2: Natural Attenuation with (ICs) and RTD* for Waste Sites; and MNA with ICs for Groundwater	Alt 3: Natural Attenuation with ICs and RTD* for Waste Sites; and P&T and MNA with ICs for Groundwater	Alt 4: Natural Attenuation with ICs and Aggressive RTD for Waste Sites; and P&T with MNA and ICs for Groundwater	Alt 5: Natural Attenuation with ICs and RTD* for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs for Groundwater	Alt 6: Natural Attenuation with ICs and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs for Groundwater	Alt 7: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; Cr(VI) and Sr-90 Source Treatment with P&T and MNA with ICs for Groundwater
Total project duration (years)	0	150	40 P&T 150	40 P&T 150	15 P&T 150	15 P&T 150	15 P&T 150
Capital cost	$0	$3,800,000	$32,000,000	$140,000,000	$34,000,000	$150,000,000	$380,000,000
Annual O&M cost	$0	$16,000,000	$150,000,000	$150,000,000	$66,000,000	$65,000,000	$66,000,000
Periodic O&M cost	$0	$18,000,000	$26,000,000	$26,000,000	$21,000,000	$21,000,000	$21,000,000
Total nondiscounted cost	$0	$38,000,000	$210,000,000	$320,000,000	$120,000,000	$240,000,000	$470,000,000
Total present value of alternative	$0	$23,000,000	$160,000,000	$270,000,000	$99,000,000	$210,000,000	$450,000,000
Expected Accuracy Range for Total Present Value: -30% to +50%							
-30%	$0	$16,000,000	$110,000,000	$190,000,000	$69,000,000	$150,000,000	$320,000,000
50%	$0	$35,000,000	$230,000,000	$400,000,000	$150,000,000	$320,000,000	$680,000,000

Note: The accuracy is expected to be within +50% and -30%. The costs presented in this table include general administration and contingencies.

*RTD applied to the 100-B-34 dichromate transfer pipeline segment only.

IC = institutional control

MNA = monitored natural attenuation

O&M = operations and maintenance

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Terms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CHPRC	CH2M HILL Plateau Remediation Company
DOE	U.S. Department of Energy
ECE	environmental cost estimate
EPA	U.S. Environmental Protection Agency
FS	feasibility study
G&A	general and administrative
IC	institutional control
MDBI	Mob/Demob Bond & Insurance
MNA	monitored natural attenuation
NPL	National Priorities List (CERCLA)
O&M	operations and maintenance
OH&P	overhead and profit
OU	operable unit
P&T	pump and treat
PRG	preliminary remediation goal
PRZ	periodically rewetted zone
RCRA	*Resource Conservation and Recovery Act of 1976*
RTD	removal, treatment and disposal
ROD	Record of Decision
ROM	rough order of magnitude
SSL	soil screening level
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*

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1 Introduction

CH2M HILL Plateau Remediation Company (CHPRC) has prepared this environmental cost estimate (ECE) in support of DOE/RL-2010-96, *Remedial Investigation/Feasibility Study for 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*. The following discussion provides the basis of this estimate. The cost estimate summaries have been prepared for comparative response action evaluations based on information available at the time that this ECE was prepared. The cost estimates reflects specific response action approaches, scope assumptions and exclusions, and cost-estimating methodologies. The response action cost estimates have expected ranges of accuracy, described in Chapter 9, "Estimate Classification." The final costs for the selected response action will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final project scope, final project schedule, and other factors.

2 Purpose of Estimate

This ECE and cost estimate backup supports the response action alternatives analysis provided in DOE/RL-2010-96. It provides an overview of response action-specific cost inputs, methodology, and results. .

The purposes of this ECE are as follows:

- Describe the methodology applied in performing the cost estimates
- Describe the general and action-specific assumptions and cost inputs applied to the cost estimates
- Summarize the response action alternative cost estimates

This ECE also documents the references that provide more detailed information used to prepare the cost estimates.

3 General Project Description

The 100-BC Area consists of the 100-BC-1 and 100-BC-2 Source Operable Units (OUs) and the 100-BC-5 Groundwater Operable Unit within the 100 Area National Priorities List Site located in Washington State at the U.S Department of Energy's (DOE's) Hanford Site.

In the early 1990s the U.S. Environmental Agency (EPA), the Washington State Department of Ecology, and the U.S. Department of Energy (DOE) (known as the Tri-Parties) decided that sufficient information was known about contaminated soil and groundwater at the Hanford Site to begin cleanup with a focus to protect the Columbia River. This decision led to an early start for cleanup of contaminated soil and groundwater in areas of the Hanford Site that border the river, an area known as the River Corridor.

For the purpose of remediation, the River Corridor was divided into the following geographic areas: 100-BC, 100-K, 100-D, 100-H (managed as 100-D/H), 100-N, 100-F, 100-IU2, and 100-IU-6 (managed as geographic areas 100-F/IU-2/IU). These geographic areas include OUs, source OUs, and facilities that encompass the 100 Area NPL sites. This cost estimate encompasses the cost of the seven alternatives evaluated in the Feasibility Study for the 100-BC-1, 100-BC-2, and 100-BC-5 OUs (DOE/RL-2010-96). The seven feasibility study (FS) alternatives focus on the following waste sites within the 100 BC area: 100-B-34 Pipelines; 116-B-5 Crib; 116-C-1 Trench; 116-B-16 Tank; 118-B-1 Burial Ground; 118-B-6A Burial Ground; 118-B-8:4 Fuel Storage Basin.; and groundwater contaminated with hexavalent chromium (Cr(VI)) and strontium-90 (Sr-90).

4 Scope of Work

The cost estimate for the 100-BC Feasibility Study project was developed in accordance with EPA 540-R-00-002 A, *Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, OSWER 9355.0-75, and standard industry practices .

Quantities used in the creation of this estimate were based on the information provided in Environmental Calculation File (ECF), ECF-100BC1-11-0150, Rev. 2, *Cost Estimate Inputs for Remedial Investigation/Feasibility Study Alternatives for 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*.

4.1 Waste Site Alternatives

This section provides an overview of the remedial alternative concepts developed for detailed and comparative analysis and cost estimating. Seven alternatives are evaluated to address waste sites and groundwater.

Table 1. Waste Sites and Groundwater Sources

Waste Sites	Waste Sites	Groundwater Sources
100-B-34 Pipelines	116-B-5 (Crib)	Cr(VI) plume
118-B-8:4 Fuel Storage Basin	118-B-1 (Burial Ground)	Sr-90 Plume
116-C-1	116-B-6A Crib and the 116-B-16 Tank	

- Alternative 1: No Action
  - The NCP ("Remedial Investigation/Feasibility Study and Selection of Remedy" (40 CFR 300.430(e)(6)) requires consideration of a No Action Alternative. The No Action Alternative, which serves as a baseline for evaluating other remedial alternatives, is retained throughout the FS process. No Action means that no further remediation would be implemented to alter the existing conditions.
- Alternative 2: Natural Attenuation with ICs and RTD for Waste Sites; and MNA with ICs for Groundwater
  - As suggested by EPA guidance (*The Feasibility Study: Development and Screening of Remedial Action Alternatives* [OSWER Directive 9355.3-01FS3]), Alternative 2 uses a strategy of limited additional actions and builds off the interim actions previously completed at applicable waste sites.

    The primary components of this alternative include:

    - Maintaining ICs to minimize the potential for shallow soil direct contact exposure at waste sites with exceedances of human health preliminary remediation goals (PRGs) (100-B-34 Radioactive Process Sewer segments; 118-B-1, 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16).
    - RTD to address shallow soil direct contact exposure at one waste site exceeding human health PRGs (waste site 100-B-34 dichloromate transfer line segment).

    - An IC prohibiting excavation to minimize the potential for deep soil radionuclide direct contact exposure at waste sites 116-C-1, 118-B-1, 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16.
    - ICs prohibiting irrigation at waste sites with exceedances of groundwater protection soil screening levels (116-C-1) and SSLs and PRGs (118-B-1).
    - MNA and ICs for the Cr(VI) and Sr-90 groundwater plumes and the Cr(VI) and Sr-90 periodically rewetted zone (PRZ) sources until groundwater PRGs are met.
    - Groundwater sampling and analysis, data evaluation, and reporting to confirm that the remedy is protective and that natural attenuation processes are reducing COC concentrations in accordance with expectations. The performance monitoring program also provides a basis for determining when remedial action is complete and ICs can be removed.

- Alternative 3: Natural Attenuation with ICs and RTD for Waste Sites; and Pump and Treat (P&T) and MNA with ICs for Groundwater
  - Alternative 3 is the same as Alternative 2 except that it uses P&T and MNA for remediation of groundwater. The primary components of this alternative include:
    - Maintaining ICs to minimize the potential for shallow soil direct contact exposure at waste sites exceeding human health PRGs (100-B-34 Radioactive Process Sewer segments; 118-B-1, 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16).
    - RTD to address shallow soil direct contact exposure at one waste site exceeding human health PRGs (waste site 100-B-34 dichloromate transfer line segment).
    - An IC prohibiting excavation to minimize the potential for deep soil radionuclide direct contact exposure at waste sites 116-C-1, 118-B-1, 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16.
    - ICs prohibiting irrigation at waste sites exceeding groundwater protection SSLs (116-C-1) and SSLs and PRGs (118-B-1).
    - P&T for Cr(VI) for 40 years with Sr-90 co-extraction to control plume migration to the river, and to remediate the Cr(VI) plume through extraction, treatment, and reinjection.
    - Installating 10 new monitoring wells: 6 shallow wells in year 1 and four deep wells in year 6.
    - MNA and ICs for the balance of the Sr-90 groundwater plume remaining after 40 years of P&T, and the Cr(VI) and Sr-90 PRZ sources until groundwater PRGs are met.
    - Groundwater sampling and analysis, data evaluation, and reporting to confirm that the remedy is protective and that natural attenuation processes are reducing COC concentrations in accordance with expectations. The performance monitoring program also provides a basis for determining when remedial action is complete and ICs can be removed.
  - Under Alternative 3, P&T for Cr(VI) with co-extraction of Sr-90 is used to clean up the Cr(VI) remedial action target area. Extracted groundwater is pumped from four shallow and two deep extraction wells to a 100-BC transfer station and then pumped through an aboveground pipeline to the existing 100-KW treatment plants. The water will be treated to remove Cr(VI) and the treated water returned to 100-BC through an aboveground pipeline for injection to the aquifer via four injection wells

- Alternative 4: Natural Attenuation with ICs and Aggressive RTD for Waste Sites; and P&T and MNA with ICs for Groundwater
  - Alternative 4 includes RTD, natural attenuation, and institutional controls for the waste sites. Groundwater remedial action components are the same as Alternative 3.

    The primary components of this alternative include:

    - Natural attentuation and ICs to prevent direct contact exposure for waste site (116-B-5) where PRGs are expected to be met by radioactive decay, and for waste site (118-B-1) where PRGs are expected to be met by radioactive decay.
    - Shallow RTD at four waste sites (100-B-34 [all pipeline segments], 118-B-8:4, and 116-B-6A/ 116-B-16) exceeding direct contact human health PRGs.
    - Deep RTD to the total depth of contamination at waste sites 118-B-1 and 116-C-1. Deep excavation at 118-B-1 addresses the groundwater protection SSL and PRG for tritium. At 116-C-1, deep excavation addresses the groundwater protection SSL exceedance for Sr-90 while also addressing a potential Sr-90 PRZ source to groundwater.
    - An IC prohibiting excavation to minimize the potential for deep soil radionuclide direct contact exposure at waste sites 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16.
    - P&T for Cr(VI) groundwater plume for 40 years with MNA and ICs for the balance of the Sr-90 groundwater plume following P&T cessation, and for the Cr(VI) and Sr-90 PRZ sources, until groundwater PRGs are met.
- Alternative 5: Natural Attenuation with ICs and RTD for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs for Groundwater
  - Alternative 5 includes the same waste site components as Alternatives 2 and 3. To address groundwater COCs, this alternative includes 15 years of P&T for Cr(VI) with co-extraction of Sr-90 and targeted in situ source treatment to address Cr(VI) PRZ source.

    The primary components of this alternative include:

    - ICs and natural attenuation to minimize the potential for shallow soil direct contact exposure at waste sites exceeding human health PRGs (100-100-B-34 radioactive process sewer segments, 118-B-1, 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16).
    - RTD to address shallow soil direct contact exposure at one waste site exceeding human health PRGs (waste site 100-B-34 dichromate transfer line segment).
    - ICs prohibiting irrigation at waste sites with exceedances groundwater protection SSLs (116-C-1) and SSLs and PRGs (118-B-1).
    - P&T for Cr(VI) for 15 years (with Sr-90 co-extraction) to control plume migration to the river and to remediate the Cr(VI) plume through extraction, treatment, and reinjection. The extraction well layout is the same as Alternatives 3 and 4, except one extraction well is added.
    - In situ treatment of the Cr(VI) PRZ source during first year of P&T operations.

    - MNA and ICs for the balance of the Sr-90 groundwater plume remaining after 15 years of P&T, and the Sr-90 PRZ source, until groundwater PRGs are met.

  - Under Alternative 5, P&T for Cr(VI) with co-extraction of Sr-90 is used to clean up the Cr(VI) remedial action target area. Extracted groundwater is pumped from five shallow and two deep extraction wells to a 100-BC transfer station and then pumped through an aboveground pipeline to the existing 100-KW treatment plant. The water will be treated to remove Cr(VI) and the treated water returned to 100-BC through an aboveground pipeline for injection to the aquifer through four injection wells. Following 15 years of P&T operations, MNA and ICs are used to address the remaining portion of the Sr-90 plume.

  - This alternative uses in situ treatment of the Cr(VI) PRZ source to accelerate achievement of the surface water protection PRGs for Cr(VI) within a shorter timeframe compared to Alternatives 3 and 4. Substrate injection will be performed using temporary injection wells to promote in situ reduction of Cr(VI) to trivalent chromium (Cr(III)) upgradient of the extraction wells. Assuming in situ treatment occurs during the first year of P&T, the simulated duration required for P&T operations to achieve and maintain Cr(VI) concentrations below the 10 µg/L surface water protection PRG at the shoreline is 15 years. MNA will also contribute to achieving cleanup levels for Sr-90 following cessation of P&T operations.

- Alternative 6: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for Groundwater

  – Alternative 6 includes the same waste site components as Alternative 4. Groundwater remedial action components and in situ source treatment for Cr(VI) are the same as Alternative 5.

    The primary components of this alternative include:

    - Natural attenuation and ICs to prevent direct contact exposure for waste site (116-B-5) where PRGs are expected to be met by radioactive decay, and for waste site (118-B-1) where PRGs are expected to also be met by radioactive decay.

    - Shallow RTD at waste sites exceeding direct contactexposure at waste sites 100-B-34 (all pipeline segments), 118-B-8:4, and 116-B-6A/116-B-16.

    - Deep RTD to the total depth of contamination at waste sites 118-B-1 and 116-C-1. Deep excavation at 118-B-1 addresses the groundwater protection SSL and PRG exceedance for tritium. At 116-C-1, deep excavation addresses the groundwater protection SSL exceedance for Sr-90 while also addressing a potential Sr-90 PRZ source to groundwater.

    - An IC prohibiting excavation to minimize the potential for deep soil radionuclide direct contact exposure at waste sites 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16.

    - P&T for Cr(VI) (with Sr-90 co-extraction) to control plume migration to the river, and to remediate the Cr(VI) plume through extraction, treatment, and reinjection. The extraction well layout is the same as for Alternative 5.

    - In situ treatment of a portion of the Cr(VI) PRZ source during the first year of P&T operations.

    - MNA and ICs for the balance of the Sr-90 groundwater plume remaining after 15 years of P&T, and the Sr-90 PRZ source until groundwater PRGs are met.

- Alternative 7: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; Cr(VI) and Sr-90 Source Treatment, and P&T and MNA with ICs for Groundwater.
  - Alternative 7 includes the same waste site and groundwater components as Alternative 6, with the addition of in situ treatment for Sr-90 at waste site 116-C-1 and the Sr-90 source areas.

    The primary components of this alternative include:

    - Natural attenuation and ICs to prevent direct contact exposure for waste site (116-B-5) where PRGs are expected to be met by radioactive decay, and for waste site (118-B-1) where PRGs are expected to also be met by radioactive decay.
    - RTD to address shallow soil direct contact exposure at waste sites 100-B-34 (all pipeline segments), 118-B-8:4, and 116-B-6A/116-B-16.
    - Deep RTD to the total depth of contamination at at 118-B-1 to address the groundwater protection SSL and PRG exceedance for tritium.
    - An IC prohibiting excavation to minimize the potential for deep soil radionuclide direct contact exposure at waste sites 118-B-8:4, 116-B-5, and 116-B-6A/116-B-16.
    - P&T for Cr(VI) (with Sr-90 co-extraction) for 15 years to control plume migration to the river, and to remediate the Cr(VI) plume through extraction, treatment, and reinjection. The extraction well layout is the same as for Alternatives 5 and 6.
    - In situ treatment of the Cr(VI) PRZ source during the first year P&T operations.
    - In situ treatment of two Sr-90 PRZ source areas: Area 1 (waste site 116-C-1), which exceeds groundwater protection SSLs and is a potential PRZ source of Sr-90 to groundwater; and Area 2, which overlies the Sr-90 plume.
    - MNA and ICs for the balance of the Sr-90 plume remaining after 15 years of P&T.

5 Estimate Methodology

This cost estimate was prepared based on engineering development that occurred a step beyond the FS level. Assumed project scope items were itemized at a major assembly level, and unit costs were applied for the major assemblies, with some breakout of more detailed support costs where deemed necessary for clarity. Where available, costs for major systems were based on existing system costs at the Hanford Site. Percentage allowances were applied for some of the capital and operations and maintenance (O&M) cost items based on Hanford Site and environmental project experience.

This cost estimate has been prepared to use in project evaluations and is based on the information available at the time that this estimate was prepared. The final cost of the project will depend on final design, selected scope of work, actual labor and material costs, competitive market conditions, implementation schedule, and other factors. As a result, the final project costs may vary from the estimate presented here; therefore, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Appendix B provides detailed cost estimating worksheets for each of the alternatives in this estimate.

6 Markups

The following typical markups were applied to the cost estimate:

- Mob/Demob Bond & Insurance (MDBI) applied to Capital costs: 10 percent
- Contractor overhead and profit (OH&P): 25 percent or 0 percent (when CHPRC only)
- Washington State Sales Tax of 8.6 percent
- Scope Contingency of 15 percent and Bid Contingency of 10 percent
- The Project management, Remedial Design, and Construction Management percentages are based upon the total cost of the Capital for each alternative, therefore the percentages change per alternative. The percentages are as follows:
  - Alternative 2: Project Management of 5 percent, Remedial Design of 8 percent, and Construction Management of 6 percent for Capital Costs, Technical Support Services for O&M
  - Alternative 3 through Alternative 6: Project Management of 5 percent, Remedial Design of 6 percent, and Construction Management of 6 percent.
- CHPRC general and administrative (G&A): 20 percent

The markups were added in the following order:

1. MDBI
2. The contractor OH&P markup was applied to any non-CHPRC labor, equipment, and materials. Where there was no contractor under CHPRC, this markup is 0 percent.
3. WA Sales Tax
4. Scope and Bid Contingencies
5. Project Management, Remedial Design, and Construction Management
   a. Alt 2: Project Management, Remedial Design, and Construction Management for Capital Costs, Technical Support Services for O&M
   b. Alt 3 – Alt 6: Project Management, Remedial Design, and Construction Management for Capital Costs, Technical Support Services for O&M
6. The CHPRC G&A markup was added to the subtotal after OH&P markup.

7 Contingencies

The following contingencies were used in the cost estimate:

- Scope contingency: 15 percent (Figure 1)
- Bid contingency: 10 percent (per EPA guidance for FS costs, “Bid contingency typically ranges from 10 to 20 percent”, pp 5-11)
- Scope and bid contingencies (Figure 1) are based on EPA guidance (EPA 540-R-00-002, pp. 5-10 and 5-11)

Exhibit 5-6
Example FS-Level Scope Contingency Percentages

Remedial Technology	Scope Contingency (%)
Soil Excavation	15-55
Groundwater Treatment (Multiple)	15-35
On-Site Incineration	15-35
Extraction Wells	10-30
Vertical Barriers	10-30
Synthetic Cap	10-20
Sludge Stabilization	10-20
Off-Site Disposal	5-15
Off-Site Incineration	5-15
Drum Processing	5-15
Bulk Liquid Processing	5-15
Groundwater Treatment (Single)	5-10
Clay Cap	5-10
Surface Grading/Diking	5-10
Revegetation	5-10

Note: From Exhibit 5-6, "Example FS-Level Scope Contingency Percentages," in EPA 540-R-00-002, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*.

Figure 1. Scope Contingency Percentages Ranges

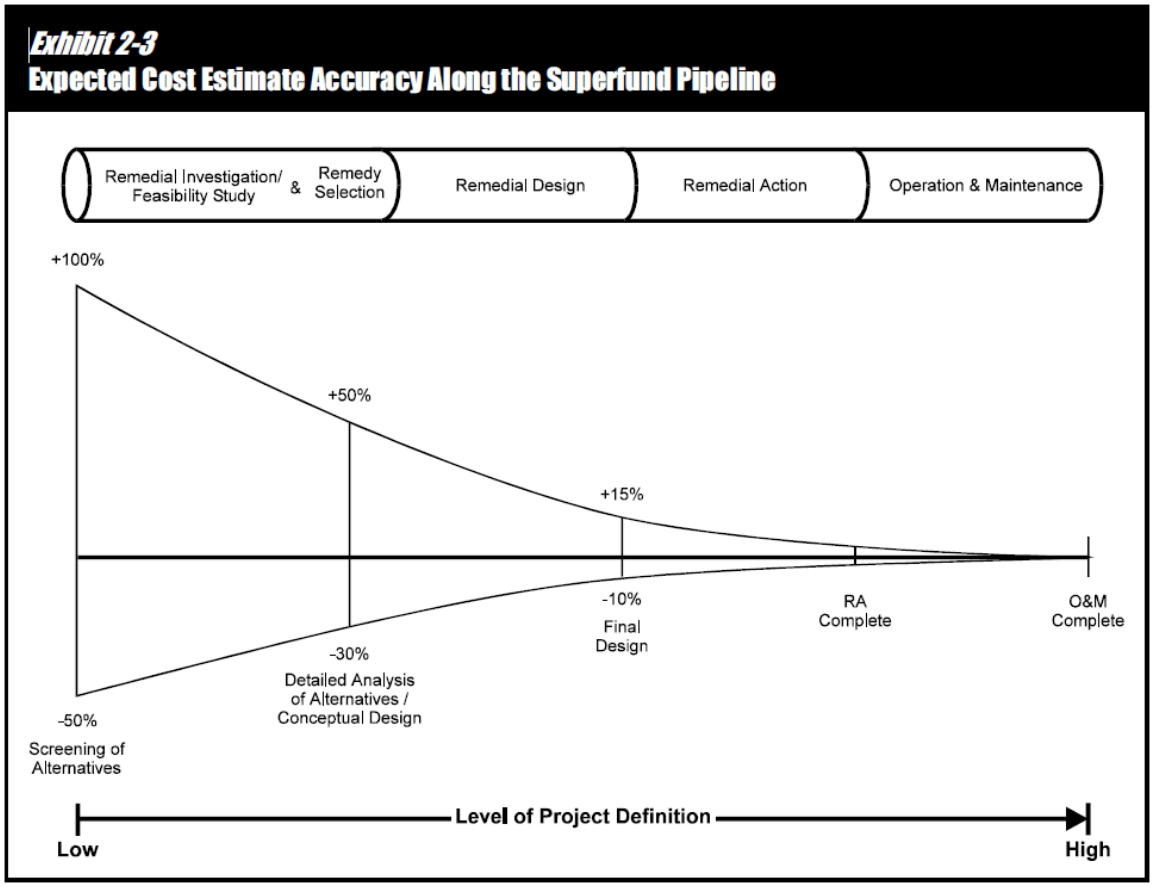
8 Escalation Rate

Escalation is not calculated in this estimate. The estimates are presented as 2016 costs.

9 Estimate Classification

The expected accuracy range of the cost estimate at this stage is approximately +50 percent, -30 percent. This accuracy range is consistent with EPA guidance (EPA 540-R-00-002) (Figure 2) for the level of project definition available at this point in the Superfund process.

The expected accuracy range is an indication of the degree to which the final cost outcome for a given project could vary from the estimated cost. Accuracy is traditionally expressed as a "±" percentage range around the point estimate after application of contingency, with a stated level of confidence that the actual cost outcome would fall within this range ("±" measures are a useful simplification, given that actual cost outcomes have different frequency distributions for different types of projects). Typically, this results in a 90 percent confidence that the actual cost will fall within the bounds of the low and high ranges.



Note: From Exhibit 2-3, "Expected Cost Estimate Accuracy Along the Superfund Pipeline," in EPA 540-R-00-002, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*.

Figure 2. Cost Estimate Accuracy

The accuracy range of an estimate is dependent upon a number of characteristics of the estimate input information and the estimating process. The extent and the maturity of the input information as measured by percentage completion (and related to level of project definition) is an important determinant of accuracy. However, there are additional factors, other than the available input information, that also greatly affect the estimate accuracy measures. Primary among these factors are the state of technology in the project and the quality of reference cost-estimating data.

The accuracy of any given estimate is not fixed or determined by its classification category. Significant variations in accuracy from estimate to estimate are possible if any of the determinants of accuracy (e.g., technology, quality of reference cost data, quality of the estimating process, and skill and knowledge of the estimator) may vary. Accuracy is also not necessarily determined by the methodology used or the effort expended. Estimate accuracy must be evaluated on an estimate-by-estimate basis, usually in conjunction with some form of risk analysis process.

10 Present Value Analysis

As per EPA Guidance (EPA 540-R-00-002), the cost estimate includes present value calculations for work performed throughout multiple years. The present value method establishes a common baseline for evaluating costs that occur during different time periods, thus allowing for direct cost comparisons between different alternatives. The present value represents the dollars that would need to be set aside

today, at the defined real discount rate, to ensure that funds would be available in the future as they are needed to perform the response action alternative. The purpose of the PV spreadsheets is to calculate the total present value for each alternative.

For Federal facility sites being cleaned up using Superfund authority, it is generally appropriate to apply the real discount rates found in Appendix C of OMB Circular A-94 (*Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Office of Management and Budget).

Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent)

3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
0.3	0.6	0.8	1.0	1.2	1.5

Analyses of programs with terms different from those presented above may use a linear interpolation. For example, a four-year project can be evaluated with a rate equal to the average of the three-year and five-year rates. Programs with durations longer than 30 years may use the 30-year interest rate.

Note: From OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Appendix C, Revised November 2015.

Figure 3. Real Discount Rates

11 Cost Resources

The following cost resources were used in the development of the cost estimates:

- RSMeans (production and equipment rental rates, 2013a and 2013b)
- CHPRC historical data
- Vendor quotes and subcontracts (well drilling, completion costs, and pipeline fabrication)
- CHPRC finance (labor and overhead rates)
- Mission Support Alliance published service rates (heavy equipment and operators)
- Estimator judgment
- Subject matter expert information
- See Appendix C for more information.

Labor unit prices reflect a burden rate, including workers' compensation, unemployment taxes, fringe benefits, and medical insurance (i.e., at 2016 rates).

12 Labor Costs

The estimate has been adjusted for local area labor rates through use of finance department resource rates as agreed upon in current contracts.

13 Sales Tax

Sales tax is included in non-labor costs based on previous Hanford Site P&T systems and components used in this estimate. Washington State sales tax is 8.6 percent.

14 Allowance Costs

The cost estimate includes the following allowances within the cost estimate:

- Electrical hookups, including disconnect boxes
- Water Level Sensors
- Survey Tents
- Well decommissioning (shallow and deep)
- Upgrades to the 100-KW treatment facility to process groundwater from the 100-BC-5 OU

The assumptions used in the estimate include Project management, Remedial Design, and Construction Management used in capital costs and Technical Support services costs based on percentage in accordance with EPA guidance (EPA 540-R-00-002, Exhibit 5-8) (Figure 4).

Exhibit 5-8
Example Percentages for Professional/Technical Services Capital Costs

Capital Cost Element	< $100K (%)	$100K-$500K (%)	$500K-$2M (%)	$2M-$10M (%)	> $10M (%)
Project Management	10	8	6	5	5
Remedial Design	20	15	12	8	6
Construction Management	15	10	8	6	6

Note: From Exhibit 5-8, "Example Percentages for Professional/Technical Services Captical Costs," in EPA 540-R-00-002, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*.

Figure 4. Example Percentages for Project Management and Technical Services Capital Costs

14.1 Construction

The following assumptions were made in regard to construction for this cost estimate:

- Deep wells are 200 ft in depth.
- Shallow wells are 100 ft in depth.
- Labor, material and subcontractor costs for the 100-KX expansion were determined from labor costs build ups and historical costs.
- Extraction well line items include:
  - Drilling mobilization (completion, cleanup and demob included)
  - Project management crew
  - Extraction transfer station
  - Pump assembly, pump setting crew

  - Landing plate, riser pipe, discounnect boxes, allowance for electrical hookups, tray cable, extraction well rack, water level sensor, fiber optic splice box, fiber optic cable and interfaces,
  - 10,000 gallon plastic water storage tank
  - 3–inch and 8-inch High Density Polyethylene (HDPE) pipe, pipe fusion crew (including testing), pipe fusion machine, freight for pipe
- Injection wells
  - Drilling mobilization, completion, cleanup and demobilization, drill cuttings disposal
  - Project management crew
  - 4-inch and 8-inch HDPE pipe, pipe fusion crew (includes testing), pipe fusion machine, freight for pipe
  - Injection rack, riser pipe, landing plate, tray cable
  - Transfer Station
  - Geologist/Geophysicists/Hydrogeologist
- Excavation line items consists of:
  - Excavator cost for contaminated and uncontaminated
  - Excavation crew
  - Fuel for machinery (including delivery)
  - Environmental Restoration Disposal Facility disposal
  - Backfill and soil cover crew
  - Sampling and analysis
- Water main needs to be moved to gain access to sewer pipe (100-B-34)
- In situ reduction consists of:
  - Mobilization and refurbishing skids
  - Drilling
  - Sampling support
  - Install injection system and inject
  - Demobilization
- Apatite Injections consists of:
  - Mobilization and refurbishing skids
  - Sampling support
  - Shallow temporary wells installation
  - Demobilization

14.2 Operations and Maintenance

The following assumptions were made in regard to O&M for this cost estimate:

- Operating costs of P&T system based on 100-BC-5 at 400 gallons per minute.

- Pump replacement for extraction and monitoring wells will occur every 5 and 10 years, respectively.
- Extraction, injection, and monitoring wells are replaced every 25, 15 and 25 years, respectively.
- Extraction, injection, and monitoring wells are rehabilitated every 5, 2 and 10 years, respectively.

14.3 Institutional Controls

While remediation is underway, ICs will be implemented to control access and prevent exposure to contamination. The two types of ICs that will be used for the 100-BC-5 are remedy-specific and programmatic. The ICs specific for the 100-BC-5 remedy are expected to be implemented independently for each waste site and groundwater plume.

Since remedy-specific ICs are focused on individual waste sites or groundwater plumes, they can be removed after remediation goals have been achieved. Appendix D provides detailed information regarding the remedy-specific ICs expected within each remedy alternative.

The current programmatic ICs are to control access onto and specific uses of the Hanford Site. In addition to preserving the Hanford Reach National Monument and maintaining Hanford Site security and safety, the ICs also protect human health and the environment by limiting potential exposure to hazardous substances. Many of these multipurpose or programmatic controls are typically required as ICs by each CERCLA Record of Decision (ROD) on the Hanford Site. The programmatic controls include site access, personnel badging, real estate and deed restrictions, and warning signs along the Columbia River bank and other access points. Also included are maintaining a current Hanford Sitewide IC plan including controls for excavating soil; accessing and using groundwater; and irrigation restrictions. While these controls transcend any specific CERCLA ROD or even the overall CERCLA cleanup process, DOE and EPA recognize the importance of maintaining these controls until unrestricted use related to the protection of human health and the environment is permitted.

Only remedy-specific IC are included within each of the alternative cost estimates. Since the programmatic ICs costs will be the same for each alternative, these costs are presented separately rather than within each alternative estimate.

The programmatic IC costs for the Hanford Site have been projected for the next 1,000 years. The total nondiscounted cost for the ICs for 1,000 years is estimated to be $542,527,000 for the Hanford Site (about $22,700,000 per ROD). The total discounted cost for the ICs at the Hanford Site are estimated at $83,220,000 (about $3,500,000 per ROD).

14.4 Deep RTD Rough Order of Magnitude Costs

Rough Order of Magnitude Costs (ROM) were developed for deep RTD of the following 29 waste sites. Deep soil is considered soil greater than 15 ft below the ground surface.

- 100-B-5 Trench
- 100-B-8:1 Pipelines
- 100-B-8:2 Pipelines
- 100-B-14:1 Process Sewer
- 100-B-21:4 Pipeline
- 100-B-34 Radioactive Process Sewer
- 100-C-6:1 Effluent Pipelines
- 100-C-6:2 Effluent Pipelines

- 100-C-6:3 Effluent Pipelines
- 100-C-6:4 Pipelines Discovery Areas
- 116-B-1 Trench
- 116-B-2 Trench
- 116-B-3 Crib
- 116-B-4 French Drain
- 116-B-6A Crib
- 116-B-11 Retention Basin
- 116-B-14 Trench
- 116-B-16 Trench
- 116-C-1 Trench
- 116-C-2A Crib
- 116-C-2B Pump Station
- 116-C-2C Sand Filter
- 116-C-3 Storage Tanks
- 116-C-5 Retention Basins
- 118-B-1 Burial Ground
- 118-B-6 Burial Ground
- 118-B-8:4 Soil Contamination.
- 118-C-1 Burial Ground
- 118-C-3:2 Ancillary Support Structures and Underlying Soils

Table 2 summarizes the ROM costs for the 29 waste sites. Appendix E provides details of the ROM RTD costs for these 29 waste sites.

Table 2. Deep ROM Costs Summary

Site Name	ROM Cost
100-B-5	$21,000,000
100-B-8:1, 100-C-6:1	$8,400,000
100-B-8:2, 100-C-6:2, 100-C-6:3, 100-C-6:4	$51,000,000
100-B-14:1	$7,400,000
100-B-21:4	$5,200,000
100-B-34 RAD	$2,600,000
116-B-1	$9,500,000
116-B-2	$1,400,000
116-B-3	$530,000
116-B-4	$1,800,000
116-B-6A, 116-B-16	$1,900,000

Table 2. Deep ROM Costs Summary

Site Name	ROM Cost
116-B-11	$26,000,000
116-B-14	$990,000
116-C-1	$70,000,000
116-C-2A, 116-C-2B, 116-C-2C	$5,400,000
116-C-3	$910,000
116-C-5	$38,000,000
118-B-1	$89,000,000
118-B-6	$4,400,000
118-B-8:4	$40,000,000
118-C-1	$3,700,000
118-C-3:2	$9,400,000
Total	**$400,000,000**

15 Exclusions

The following items have been excluded from the estimate:

- Capital/construction costs for existing wells
- Pipeline replacement during the active portion of the project

16 Cost Summary Table

Alternatives were evaluated and estimates of duration, capital and O&M costs were developed for each alternative based on information provided by the 100-BC-1, 100-BC-2, and 100-BC-5 RI/FS project team. Table 3 presents the costs for each alternative.

17 Cost Development

Appendix A presents cost summary tables for Alternatives 2 through 7. Appendix B provides the detailed cost development reports and Appendix C provides the line item costs used in the estimate.

Table 3. Summary of Cost Estimates for Each Alternative

100-BC-1, 100-BC-2, and 100-BC-5 OUs Cost Estimate Summary by Alternative	Alt 1: No Action	Alt 2: Natural Attenuation with (ICs), and RTD[1] for Waste Sites; and MNA with ICs for Groundwater	Alt 3: Natural Attenuation with ICs, and RTD* for Waste Sites; and P&T and MNA with ICs for Groundwater	Alt 4: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and P&T with MNA and ICs for Groundwater	Alt 5: Natural Attenuation with ICs, and RTD* for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for Groundwater	Alt 6: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for Groundwater	Alt 7: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; Cr(VI) and Sr-90 Source Treatment, with P&T and MNA with ICs for Groundwater
Total project duration (years)	0	150	40 P&T 150	40 P&T 150	15 P&T 150	15 P&T 150	15 P&T 150
Capital cost	$0	$3,800,000	$32,000,000	$140,000,000	$34,000,000	$150,000,000	$380,000,000
Annual O&M cost	$0	$16,000,000	$150,000,000	$150,000,000	$66,000,000	$65,000,000	$66,000,000
Periodic O&M cost	$0	$18,000,000	$26,000,000	$26,000,000	$21,000,000	$21,000,000	$21,000,000
Total nondiscounted cost	$0	$38,000,000	$210,000,000	$320,000,000	$120,000,000	$240,000,000	$470,000,000
Total present value of alternative	$0	$23,000,000	$160,000,000	$270,000,000	$99,000,000	$210,000,000	$450,000,000

Table 3. Summary of Cost Estimates for Each Alternative

100-BC-1, 100-BC-2, and 100-BC-5 OUs Cost Estimate Summary by Alternative	Alt 1: No Action	Alt 2: Natural Attenuation with (ICs), and RTD[1] for Waste Sites; and MNA with ICs for Groundwater	Alt 3: Natural Attenuation with ICs, and RTD* for Waste Sites; and P&T and MNA with ICs for Groundwater	Alt 4: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and P&T with MNA and ICs for Groundwater	Alt 5: Natural Attenuation with ICs, and RTD* for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for Groundwater	Alt 6: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for Groundwater	Alt 7: Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; Cr(VI) and Sr-90 Source Treatment, with P&T and MNA with ICs for Groundwater
Expected Accuracy Range for Total Present Value: -30% to +50%							
-30%	$0	$16,000,000	$110,000,000	$190,000,000	$69,000,000	$150,000,000	$320,000,000
50%	$0	$35,000,000	$230,000,000	$400,000,000	$150,000,000	$320,000,000	$680,000,000

Note:. The accuracy is expected to be within +50% and -30%. The costs presented in this table include general administration and contingencies.

*RTD applied to the 100-B-34 dichromate transfer pipeline segment only.

IC = institutional control

MNA = monitored natural attenuation

O&M = operations and maintenance

18 References

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," "Remedial Investigation/Feasibility Study and Selection of Remedy," *Code of Federal Regulations*. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title40-vol27/xml/CFR-2010-title40-vol27-sec300-430.xml.

300.430, "Remedial investigation/feasibility study and selection of remedy."

40 CFR 300.430, "National Oil and Hazardous Substances Pollution Contingency Plan," "Remedial Investigation/Feasibility Study and Selection of Remedy," *Code of Federal Regulations*. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title40-vol27/xml/CFR-2010-title40-vol27-sec300-430.xml

AACE, 2011, International Recommended Practice No. 17R-97, *Cost Estimate Classification System*, American Association for the Advancement of Cost Engineering International, Morgantown, West Virginia. Available at: http://www.aacei.org/toc/toc_17R-97.pdf.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq., Pub. L. 107-377, December 31, 2002. Available at: http://epw.senate.gov/cercla.pdf.

DOE/RL-2010-96, 2016, *Remedial Investigation/Feasibility Study for the 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at:

ECF-100BC1-11-0150, 2016, *Cost Estimate Inputs for Remedial Investigation/Feasibility Study Alternatives for 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*, Rev. 2 (pending), CH2M HILL Plateau Remediation Company, Richland, Washington.

EPA/540/G-89/004, 1988, *Guidance for Conducting Remedial Investigations and Feasiability Studies Under CERCLA*, OSWER Directive 9355.3-01, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C. Available at: https://semspub.epa.gov/work/HQ/174075.pdf.

EPA 540-R-00-002, 2000, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study***,** OSWER 9355.0-75, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C. Available at: http://yosemite1.epa.gov/ee/epa/ria.nsf/vwAN/S200010.pdf/$file/S200010.pdf

OMB Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Office of Management and Budget, Washington, D.C. Available at: https://www.whitehouse.gov/omb/circulars_a094.

OSWER Directive 9355.3-01FS3, 1989, *The Feasibility Study Development And Screening of Remedial Action Alternatives*, Fact Sheet, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C. Available at: https://semspub.epa.gov/work/HQ/174411.pdf

RSMeans Facilities Construction Cost Data, 2013a, ISBN: 978-1-936335-64-0, RSMeans a division of Reed Construction Data Construction Publishers and Consults, 63 Smith Lane, Kingston, Massachuesetts.

RSMeans Heavy Construction Cost Data, 2013b, ISBN: 978-1-936335-61-9, RSMeans a division of Reed Construction Data Construction Publishers and Consults, 63 Smith Lane, Kingston, Massachuesetts.

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Appendix A

Reports

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A1 Introduction

This appendix provides summary sheets comparing the overall costs, of the 100-BC-1, 100-BC-2, and 100-BC-5 Alternatives.

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Table A-1. Comparison of Total Cost of Remedial Action Alternatives

Location: 100-BC-1, 100-BC-2, 100-BC-5 **Base Year:** 2016
Phase: RI/FS **Date:** 10/25/2016

	1	2	3	4	5	6	7
	Alternative 01	**Alternative 02**	**Alternative 03**	**Alternative 04**	**Alternative 05**	**Alternative 06**	**Alternative 07**
	No Action	NA with ICs, and RTD for Waste Sites; MNA and ICs for GW	NA with ICs, and RTD for Waste Sites; MNA with ICs for GW	NA with ICs, and Aggressive RTD for Waste Sites; and P&T and MNA with ICs for GW	NA with ICs, and RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for GW	NA with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs	NA with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) and Sr-90 Source Treatment with P&T and MNA with ICs for GW
Capital Cost	$0	$3,800,000	$32,000,000	$140,000,000	$34,000,000	$150,000,000	$380,000,000
Annual O&M Cost	$0	$16,000,000	$150,000,000	$150,000,000	$66,000,000	$65,000,000	$66,000,000
Periodic O&M Cost	$0	$18,000,000	$26,000,000	$26,000,000	$21,000,000	$21,000,000	$21,000,000
Total Non-Discounted Cost	$0	$38,000,000	$210,000,000	$320,000,000	$120,000,000	$240,000,000	$470,000,000
Total Present Value of Alternative	$0	$23,000,000	$160,000,000	$270,000,000	$99,000,000	$210,000,000	$450,000,000
Expected Accuracy Range for Total Present Value is -30% to +50%							
-30%	$0	$16,000,000	$110,000,000	$190,000,000	$69,000,000	$150,000,000	$320,000,000
50%	$0	$35,000,000	$230,000,000	$400,000,000	$150,000,000	$320,000,000	$680,000,000

Disclaimer: The information in this cost estimate is based on the best available information regarding the anticipated scope of the remedial action objectives. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedial alternatives. This is an order-of-magnitude cost estimate that is expected to be within -30 to +50 percent of the actual project costs.

Note: Present value of costs in future years discounted using OMB Circular A-94 standard rates
Note: Accuracy range selected to be within AACEI "Class 5" Feasibility Estimate accuracy range (AACEI recommended practice 17R-97)

Table A-2. Comparison of Total Cost of Remedial Action Alternatives (By Site)

Location: 100-BC-1, 100-BC-2, 100-BC-5 **Base Year:** 2016
Phase: RI/FS **Date:** 10/25/2016

Site	Site Name		1	2	3	4	5	6	7
			Alternative 01	**Alternative 02**	**Alternative 03**	**Alternative 04**	**Alternative 05**	**Alternative 06**	**Alternative 07**
			No Action	NA with ICs, and RTD for Waste Sites; MNA and ICs for GW	NA with ICs, and RTD for Waste Sites; MNA with ICs for GW	NA with ICs, and Aggressive RTD for Waste Sites; and P&T and MNA with ICs for GW	NA with ICs, and RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for GW	NA with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs for GW	NA with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) and Sr-90 Source Treatment with P&T and MNA with ICs for GW
Site	**Site Name**	**Total Project Duration (Years)**	0	150	150	150	150	150	150
1	**100-B-34 (Radioactive Process sewer)**								
		Capital Cost	$0	$0	$0	$3,300,000	$0	$3,300,000	$3,300,000
		Annual O&M Cost	$0	$290,000	$290,000	$290,000	$290,000	$290,000	$290,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$290,000	$290,000	$3,600,000	$290,000	$3,600,000	$3,600,000
		Total Present Value of Alternative	$0	$210,000	$210,000	$3,500,000	$210,000	$3,500,000	$3,500,000
2	**100-B-34 (Dichromate Transfer Line)**								
		Capital Cost	$0	$2,200,000	$2,200,000	$2,200,000	$2,200,000	$2,200,000	$2,200,000
		Annual O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$2,200,000	$2,200,000	$2,200,000	$2,200,000	$2,200,000	$2,200,000
		Total Present Value of Alternative	$0	$2,200,000	$2,200,000	$2,200,000	$2,200,000	$2,200,000	$2,200,000
3	**116-C-1**								
		Capital Cost	$0	$0	$0	$52,000,000	$0	$52,000,000	$0
		Annual O&M Cost	$0	$950,000	$950,000	$0	$950,000	$0	$950,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$950,000	$950,000	$52,000,000	$950,000	$52,000,000	$950,000
		Total Present Value of Alternative	$0	$370,000	$370,000	$52,000,000	$370,000	$52,000,000	$370,000
4	**118-B-1 (burial grd)**								
		Capital Cost	$0	$0	$0	$52,000,000	$0	$52,000,000	$52,000,000
		Annual O&M Cost	$0	$440,000	$440,000	$290,000	$440,000	$290,000	$290,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$440,000	$440,000	$52,000,000	$440,000	$52,000,000	$52,000,000
		Total Present Value of Alternative	$0	$270,000	$270,000	$52,000,000	$270,000	$52,000,000	$52,000,000
5	**118-B-8:4**								
		Capital Cost	$0	$0	$0	$1,300,000	$0	$1,300,000	$1,300,000
		Annual O&M Cost	$0	$950,000	$950,000	$950,000	$950,000	$950,000	$950,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$950,000	$950,000	$2,200,000	$950,000	$2,200,000	$2,200,000
		Total Present Value of Alternative	$0	$370,000	$370,000	$1,700,000	$370,000	$1,700,000	$1,700,000
6	**116-B-5 (crib)**								
		Capital Cost	$0	$0	$0	$0	$0	$0	$0
		Annual O&M Cost	$0	$82,000	$82,000	$82,000	$82,000	$82,000	$82,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$82,000	$82,000	$82,000	$82,000	$82,000	$82,000
		Total Present Value of Alternative	$0	$78,000	$78,000	$78,000	$78,000	$78,000	$78,000
7	**116-B-6A/116-B-16 Tank**								
		Capital Cost	$0	$0	$0	$2,600,000	$0	$2,600,000	$2,600,000
		Annual O&M Cost	$0	$520,000	$520,000	$520,000	$520,000	$520,000	$520,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$520,000	$520,000	$3,100,000	$520,000	$3,100,000	$3,100,000
		Total Present Value of Alternative	$0	$300,000	$300,000	$2,900,000	$300,000	$2,900,000	$2,900,000
8	**Groundwater**								
		Capital Cost	$0	$1,500,000	$30,000,000	$30,000,000	$31,000,000	$31,000,000	$34,000,000
		Annual O&M Cost	$0	$2,500,000	$130,000,000	$130,000,000	$52,000,000	$52,000,000	$52,000,000
		Periodic O&M Cost	$0	$18,000,000	$26,000,000	$26,000,000	$21,000,000	$21,000,000	$21,000,000
		Total Non-Discounted Cost	$0	$22,000,000	$190,000,000	$190,000,000	$100,000,000	$100,000,000	$110,000,000
		Total Present Value of Alternative	$0	$14,000,000	$150,000,000	$150,000,000	$88,000,000	$88,000,000	$92,000,000
9	**Groundwater - Source Treatment**								
		Capital Cost	$0	$0	$0	$0	$1,700,000	$1,700,000	$290,000,000
		Annual O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$0	$0	$0	$1,700,000	$1,700,000	$290,000,000
		Total Present Value of Alternative	$0	$0	$0	$0	$1,700,000	$1,700,000	$290,000,000
10	**ICs 23 Deep Sites**								
		Capital Cost	$0	$0	$0	$0	$0	$0	$0
		Annual O&M Cost	$0	$11,000,000	$11,000,000	$11,000,000	$11,000,000	$11,000,000	$11,000,000
		Periodic O&M Cost	$0	$0	$0	$0	$0	$0	$0
		Total Non-Discounted Cost	$0	$11,000,000	$11,000,000	$11,000,000	$11,000,000	$11,000,000	$11,000,000
		Total Present Value of Alternative	$0	$5,100,000	$5,100,000	$5,100,000	$5,100,000	$5,100,000	$5,100,000

	Alternative 01	**Alternative 02**	**Alternative 03**	**Alternative 04**	**Alternative 05**	**Alternative 06**	**Alternative 07**
Capital Cost	$0	$3,800,000	$32,000,000	$140,000,000	$34,000,000	$150,000,000	$390,000,000
Annual O&M Cost	$0	$16,000,000	$150,000,000	$150,000,000	$66,000,000	$65,000,000	$66,000,000
Periodic O&M Cost	$0	$18,000,000	$26,000,000	$26,000,000	$21,000,000	$21,000,000	$21,000,000
Total Non-Discounted Cost	$0	$38,000,000	$210,000,000	$320,000,000	$120,000,000	$240,000,000	$480,000,000
Total Present Value of Alternative	$0	$23,000,000	$160,000,000	$270,000,000	$99,000,000	$210,000,000	$450,000,000

Appendix B

Estimate Detail

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B1 Introduction

Detailed cost estimating worksheets for each of the 100-BC-1, 100-BC-2, and 100-BC-5 OUs alternatives are provided in this appendix.

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Table B-1. Alternative 2 Cost Estimate Details

Alternative 02
NA with ICs, and RTD for Waste Sites; MNA and ICs for GW

Location: 100-BC-1, 100-BC-2, 100-BC-5 **Base Year:** 2016
Phase: RI/FS **Date:** 10/25/2016
Description: Natural Attenuation with Institutional Controls (ICs), and Removal, Treatment, and Disposal (RTD) for Waste Sites; and MNA with ICs for Groundwater

CAPITAL COSTS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	SOURCE	START YEAR	END YEAR	INTERVAL	NOTES
-			**Installing New Monitoring Wells**									
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	600	LF	$546	$327,600	OTHER	0	0	1	6 new wells = Assumes 6 shallow (100 ft) (new monitoring wells)
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	400	LF	$546	$218,400	OTHER	6	6	1	4 new wells = assumes 4 shallow (100 ft) (new monitoring wells)
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	60	HR	$103	$6,185	OTHER	0	0	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	40	HR	$103	$4,124	OTHER	6	6	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	well drilling	295 Dispose of drill cuttings	44	ton	$83	$3,625	0	0	0	1	6 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy
8	Groundwater	well drilling	295 Dispose of drill cuttings	29	ton	$83	$2,417	0	6	6	1	4 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	OTHER	0	0	1	6 wells, assumed 1,500 LF of power cable for each well
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	6000	LF	$2	$9,000	OTHER	6	6	1	4 wells, assumed 1,500 LF of power cable for each well
-			**Excavation - site 118-B-8:4**									
5	118-B-8:4	Excavation	111 Excavation Crew (#43) Contaminated	0	Crew Hr	$1,223	$0	OTHER	0	0	1	excavation during contaminated areas based on cy/60hrs
5	118-B-8:4	Excavation	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	OTHER	0	0	1	excavation during uncontaminated areas based on cy/180hrs
5	118-B-8:4	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	OTHER	0	0	1	excavator time based on crew time for excavating contaminated soil
5	118-B-8:4	Excavation	113 Excavator (Un-contaminated)	0	MO	$5,200	$0	OTHER	0	0	1	excavator time based on crew time for excavating non contaminated soil
5	118-B-8:4	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	0	EA	$165	$0	OTHER	0	0	1	analytical during excavaion to verify clean based on SF/6724
-			**ERDF Disposal & Backfill - site 118-B-8:4**									
5	118-B-8:4	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	0	EA	$497	$0	HISTORICAL	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification
5	118-B-8:4	ERDF Disposal	811 ERDF WG	0	Ton	$83	$0	OTHER	0	0	1	CY of contaminated soild going to ERDF
5	118-B-8:4	Backfill	133 Backfill and soil cover crew (#46)	0	Crew Hr	$1,359	$0	OTHER	0	0	1	backfill crew based on cy/185
5	118-B-8:4	Backfill	112 DumpTrucks	0	MO	$6,200	$0	0	0	0	1	Trucks from borrow pit
5	118-B-8:4	Backfill	134 Front End Loader	0	MO	$15,500	$0	0	0	0	1	front end loader to deliver and sprad backfill soil
5	118-B-8:4	Backfill	137 Water Truck	0	MO	$6,200	$0	0	0	0	1	water truck
5	118-B-8:4	Backfill	139 Revegetate area	0	Ac	$5,010	$0	HISTORICAL	0	0	1	revegetate area
5	118-B-8:4	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$0	OTHER	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	0	HR	$70	$0	0	0	0	1	truck drivers
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	0	HR	$70	$0	0	0	0	1	operators for water truck and front end loader
5	118-B-8:4	Excavation	118 Fuel - Diesel	0	gal	$4	$0	OTHER	0	0	1	fuel delivery
5	118-B-8:4	Excavation	119 Fuel Delivery	0	gal	$2	$0	OTHER	0	0	1	fuel
-			**Excavation - site 100-B-34 Dichromate Transfer Line**									
2	100-B-34 (Dichromate Transfer Line)	Excavation	110 Excavation Crew (#42) Un-contaminated	87	Crew Hr	$904	$79,046	OTHER	0	0	1	excavation during uncontaminated areas based on cy/180hrs
2	100-B-34 (Dichromate Transfer Line)	Excavation	111 Excavation Crew (#43) Contaminated	4	Crew Hr	$1,223	$5,301	OTHER	0	0	1	excavation during contaminated areas based on cy/60hrs
2	100-B-34 (Dichromate Transfer Line)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$2,983	OTHER	0	0	1	excavator time based on crew time for excavating non contaminated soil
2	100-B-34 (Dichromate Transfer Line)	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	OTHER	0	0	1	excavator time based on crew time for excavating contaminated soil
2	100-B-34 (Dichromate	Excavation	05 OPERATOR GROUP VIII	92	HR	$70	$6,420	0	0	0	1	operators for the excavator
2	100-B-34 (Dichromate Transfer Line)	Excavation	145 Move water main	0	LS	$1,200,000	$420,000	OTHER	0	0	1	Move fire supression line above dichromate transfer lines
-			**Sampling & Analysis: 100-B-34 - Dichromate Transfer Line**									
2	100-B-34 (Dichromate Transfer Line)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	OTHER	0	0	1	sampling crew for dichromate (2 hours per sample)
2	100-B-34 (Dichromate Transfer Line)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	OTHER	0	0	1	analytical during excavaion to verify clean based on SF/6724
-			**Backfill & Disposal: 100-B-34 - Dichromate Transfer Line**									
2	100-B-34 (Dichromate Transfer Line)	Excavation	133 Backfill and soil cover crew (#46)	203	Crew Hr	$1,359	$276,493	OTHER	0	0	1	backfill crew, assume LCY/185 hrs (dichromate transfer line)
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	HISTORICAL	0	0	1	assume 1 sample during ERDF loading and disposal (dichromate transfer line)
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	811 ERDF WG	19	Ton	$83	$1,616	OTHER	0	0	1	disposal of soil from dichromate transfer line
2	100-B-34 (Dichromate Transfer Line)	Backfill	112 DumpTrucks	1	MO	$6,200	$3,556	0	0	0	1	Trucks from borrow pit
2	100-B-34 (Dichromate Transfer Line)	Backfill	134 Front End Loader	1	MO	$15,500	$8,891	0	0	0	1	front end loader to deliver and spread backfill soil
2	100-B-34 (Dichromate Transfer Line)	Backfill	137 Water Truck	1	MO	$6,200	$3,556	0	0	0	1	water truck (entire length of project)

CAPITAL MARKUPS

SITE	MDBI 10%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Project Management Percent	Project Management 5%	Remedial Design Percent	Remedial Design 6%	Construction Management Percent	Construction Management 6%	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
-																			
8	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
8	$32,760	$360,360	$54,054	$36,036	**$450,450**	$38,739	**$489,189**	$73,378	$48,919	**$611,486**		$30,574		$36,689		$36,689	**$715,438**	$143,088	$0
8	$21,840	$240,240	$36,036	$24,024	**$300,300**	$25,826	**$326,126**	$48,919	$32,613	**$407,657**		$20,383		$24,459		$24,459	**$476,959**	$95,392	$0
8	$619	$6,804	$1,021	$680	**$8,505**	$731	**$9,236**	$1,385	$924	**$11,545**		$577		$693		$693	**$13,508**	$2,702	$0
8	$412	$4,536	$680	$454	**$5,670**	$488	**$6,158**	$924	$616	**$7,697**		$385		$462		$462	**$9,005**	$1,801	$0
8	$363	$3,988	$598	$399	**$4,985**	$429	**$5,414**	$812	$541	**$6,767**		$338		$406		$406	**$7,918**	$1,584	$0
8	$242	$2,659	$399	$266	**$3,323**	$286	**$3,609**	$541	$361	**$4,511**		$226		$271		$271	**$5,278**	$1,056	$0
8	$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**		$1,260		$1,512		$1,512	**$29,482**	$5,896	$0
8	$900	$9,900	$1,485	$990	**$12,375**	$1,064	**$13,439**	$2,016	$1,344	**$16,799**		$840		$1,008		$1,008	**$19,655**	$3,931	$0
-																			
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
-																			
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
5	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
-																			
2	$7,905	$86,951	$13,043	$8,695	**$108,689**	$9,347	**$118,036**	$17,705	$11,804	**$147,545**		$7,377		$8,853		$8,853	**$172,628**	$34,526	$0
2	$530	$5,831	$875	$583	**$7,288**	$627	**$7,915**	$1,187	$792	**$9,894**		$495		$594		$594	**$11,576**	$2,315	$0
2	$298	$3,281	$492	$328	**$4,101**	$353	**$4,454**	$668	$445	**$5,568**		$278		$334		$334	**$6,514**	$1,303	$0
2	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
2	$642	$7,062	$1,059	$706	**$8,828**	$759	**$9,587**	$1,438	$959	**$11,984**		$599		$719		$719	**$14,021**	$2,804	$0
2	$42,000	$462,000	$69,300	$46,200	**$577,500**	$49,665	**$627,165**	$94,075	$62,717	**$783,956**		$39,198		$47,037		$47,037	**$917,229**	$183,446	$0
-	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
2	$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**		$82		$98		$98	**$1,912**	$382	$0
2	$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**		$15		$18		$18	**$360**	$72	$0
-	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
2	$27,649	$304,142	$45,621	$30,414	**$380,178**	$32,695	**$412,873**	$61,931	$41,287	**$516,091**		$25,805		$30,965		$30,965	**$603,827**	$120,765	$0
2	$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**		$46		$56		$56	**$1,085**	$217	$0
2	$162	$1,778	$267	$178	**$2,222**	$191	**$2,413**	$362	$241	**$3,016**		$151		$181		$181	**$3,529**	$706	$0
2	$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**		$332		$398		$398	**$7,767**	$1,553	$0
2	$889	$9,780	$1,467	$978	**$12,225**	$1,051	**$13,276**	$1,991	$1,328	**$16,596**		$830		$996		$996	**$19,417**	$3,883	$0
2	$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**		$332		$398		$398	**$7,767**	$1,553	$0

2	100-B-34 (Dichromate Transfer Line)	Backfill	139 Revegetate area	0	Ac	$5,010	$1,953	HISTORICAL	0	0	1	revegetate area	$195	$2,148	$322	$215	**$2,685**	$231	**$2,916**	$437	$292	**$3,645**	$182	$219	$219	**$4,264**	$853	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	819 Survey Tent	0	LS	$120,000	$42,000	OTHER	0	0	1	survey tent $120000 (allowance)	$4,200	$46,200	$6,930	$4,620	**$57,750**	$4,967	**$62,717**	$9,407	$6,272	**$78,396**	$3,920	$4,704	$4,704	**$91,723**	$18,345	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$69	OTHER	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs. Assumes 50 boxes per day surveying.	$7	$76	$11	$8	**$95**	$0	**$95**	$14	$10	**$119**	$6	$7	$7	**$140**	$28	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	120 Fuel Charge	203.40	Hr	$16	$3,336	OTHER	0	0	1	fuel during backfill based on cubic feet of backfill	$334	$3,669	$550	$367	**$4,587**	$394	**$4,981**	$747	$498	**$6,226**	$311	$374	$374	**$7,285**	$1,457	$0

ANNUAL O&M COST

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	SOURCE	START YEAR	END YEAR	INTERVAL	NOTES
-		**100-B-34 Institutional Controls (Deep contamination)**										
1	100-B-34 (Radioactive Process sewer)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	39	1	site visits 1 per year, ICs until 2055
-		**116-C-1 Institutional Controls & Site Closeout (Deep Contamination)**					$0				1	
3	116-C-1	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	150	1	site visits once a year, ICs includes writing a brief report. No dig ICs ending in 2485 (469 years), No irrigation ICs ending in 2034
3	116-C-1	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	150	150	1	Final report (2485)
-		**118-B-1 Institutional Controls & Site Closeout (Deep Contamination)**										
4	118-B-1 (burial grd)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	65	1	Site visits once a year, ICs 2040 (shallow), 2081 (deep), and no irrigation IC until 2049
4	118-B-1 (burial grd)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	65	65	1	Site Closeout-final report 2081
-		**116-B-5 Institutional Controls & Site Closeout**										
6	116-B-5 (crib)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	5	1	Site visits, 1 per year until 2021, assume MNA monitoring is associated with these site visits (5 years)
6	116-B-5 (crib)	Site Closeout and Final Reports	950 Site closeout report - Low	1.00	EA	$19,642	$19,642	0	5	5	1	2021 - site closeout
-		**116-B-6A Institutional Controls & Site Closeout (Deep contamination)**										
7	116-B-6A/116-B-16 Tank	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	79	1	Site visits, 1 per year until 2095. Excavation ICs until year 2045 (shallow)
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	950 Site closeout report - Low	1.00	EA	$19,642	$19,642	0	79	79	1	2095 - site closeout
-		**Groundwater - Insitutional Controls & MNA**										
8	Groundwater	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	75	1	Institutional controls for 75 years starting in 2016
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	32	EA	$165	$5,280	OTHER	1	1	1	annual sampling at 32 existing wells
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	38	EA	$165	$6,270	OTHER	2	5	1	Samples/Event (2-5 Years) 4 years-annual sampling of 38 wells (lab analysis for hexavalent chromium and strontium-90)
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	42	EA	$165	$6,930	OTHER	6	10	1	Samples/Event (6-10 Years) 5 years-annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90)
8	Groundwater	MNA	02 Sampling Crew	64	team/hr	$438	$28,020	OTHER	0	0	1	annual sampling at 32 existing wells (assume 2 hours per sample)
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	OTHER	1	5	1	Samples/Event (2-5 Years) 4 years-annual sampling of 38 wells (lab analysis for hexavalent chromium and strontium-90) (assume 2 hours per sample)
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	OTHER	6	10	1	Samples/Event (6-10 Years) 5 years-annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90) (assume 2 hours per sample)
-		**MNA - sampling 1 - 5 years (every 5 years)**										
8	Groundwater	MNA	21 Tritium - Low Level (water)	0	EA	$90	$0	OTHER	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for tritium)
8	Groundwater	MNA	02 Sampling Crew	0	team/hr	$438	$0	OTHER	0	5	1	sampling crew at 2 hours per sample taken
8	Groundwater	MNA	22 VOCs (Chloroform, TCE) water	0.00	EA	$79	$0	OTHER	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for TCE and chloroform)
8	Groundwater	MNA	02 Sampling Crew	0.00	team/hr	$438	$0	OTHER	0	5	1	sampling crew at 2 hours per sample taken
-		**100-B-34 RAD - Site Closeout (Deep Contamination)**										
1	100-B-34 (Radioactive Process sewer)	Site Closeout and Final Reports	950 Site closeout report - Low	1.00	EA	$19,642	$19,642	0	39	39	1	Site closeout-final report for radioactive process sewer portion of 100-B-34 in 2055
-		**118-B-8:4 Institutional Controls & Site Closeout (Deep Contamination)**										
5	118-B-8:4	Institutional Controls	850 No dig/drilling institutional control	1.00	EA	$5,978	$5,978	RACER	0	150	1	Site visits, 1 per year for 187 years, assume MNA monitoring is associated with these site visits (187 years) for shallow soils. ICs until 32021 for deep
5	118-B-8:4	Site Closeout and Final Reports	950 Site closeout report - Low	1.00	EA	$19,642	$19,642	0	150	150	1	Closout report at year 32021 of MNA
-		**MNA - sampling Tritium**										
8	Groundwater	MNA	21 Tritium - Low Level (water)	1	EA	$90	$90	OTHER	1	34	1	Sample 1 well each year for the first 34 years.
8	Groundwater	MNA	02 Sampling Crew	2	team/hr	$438	$876	OTHER	1	34	1	Sample 1 well each year for the first 34 years, 2 hours per sample.
8	Groundwater	MNA	21 Tritium - Low Level (water)	38	EA	$90	$3,420	OTHER	35	40	1	Sample 32 existing and 6 new wells.
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	OTHER	35	40	1	Sample 32 existing and 6 new wells, 2 hours per sample
-		**ICs and Site Closeout - 23 Deep ROM Sites**										
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	67	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	150	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	39	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	49	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4

ANNUAL O&M MARKUPS

MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Technical Support Services Percent	Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$5,280	$792	$528	**$6,600**	$568	**$7,168**	$1,075	$717	**$8,960**	45%	$4,032	**$12,991**	$2,598	$0
$0	$6,270	$941	$627	**$7,838**	$674	**$8,512**	$1,277	$851	**$10,639**	45%	$4,788	**$15,427**	$3,085	$0
$0	$6,930	$1,040	$693	**$8,663**	$745	**$9,407**	$1,411	$941	**$11,759**	45%	$5,292	**$17,051**	$3,410	$0
$0	$28,020	$4,203	$2,802	**$35,025**	$3,012	**$38,037**	$5,706	$3,804	**$47,547**	45%	$21,396	**$68,942**	$13,788	$0
$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$90	$14	$9	**$113**	$10	**$122**	$18	$12	**$153**	45%	$69	**$221**	$44	$0
$0	$876	$131	$88	**$1,095**	$94	**$1,189**	$178	$119	**$1,486**	45%	$669	**$2,154**	$431	$0
$0	$3,420	$513	$342	**$4,275**	$368	**$4,643**	$696	$464	**$5,803**	45%	$2,611	**$8,415**	$1,683	$0
$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	96	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	96	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	150	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	14	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	96	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	59	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	136	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	150	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	93	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	121	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	26	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	150	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	RACER	0	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	0	150	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

PERIODIC O&M COST

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	SOURCE	START YEAR	END YEAR	INTERVAL	NOTES
-			**MNA Sampling & Analysis**									
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	24	EA	$165	$3,960	OTHER	0	0	1	First year, quarterly sampling in the 6 new wells
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	20	EA	$22	$440	OTHER	11	60	2	Samples/Event (Out Years) [Years 11-60] 50 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	20	EA	$113	$2,260	OTHER	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	42	EA	$113	$4,746	OTHER	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)
8	Groundwater	MNA	02 Sampling Crew	24	team/hr	$438	$10,508	OTHER	0	0	1	First year, quarterly sampling in the 6 new wells (assume 2 hours per sample)
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	OTHER	11	60	2	Samples/Event (Out Years) [Years 11-60] 50 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium) (assume 2 hours per sample)
8	Groundwater	MNA	02 Sampling Crew	40.00	team/hr	$438	$17,513	OTHER	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90) (assume 2 hours per sample)
8	Groundwater	MNA	02 Sampling Crew	84.00	team/hr	$438	$36,776	OTHER	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90) (assume 2 hours per sample)
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	42.00	EA	$22	$924	OTHER	61	65	1	Samples/Event (Out Years) [Years 61-65] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)
8	Groundwater	MNA	02 Sampling Crew	84.00	team/hr	$438	$36,776	OTHER	61	65	1	Samples/Event (Out Years) [Years 61-65] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium) (assume 2 hours per sample)
-			**Well Replacement & Decommissioning**									
8	Groundwater	well maintenance	350 Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	20	EA	$4,499	$89,980	OTHER	10	75	10	20 wells, replacing pumps every 10 years, assume 2 hours per well to replace pumps (monitoring wells)
8	Groundwater	well maintenance	365 Pump Setting Crew	40	Crew Hr	$529	$21,145	OTHER	10	75	10	Monitoring well pump replacement (2 hours per well) (assume 20 wells in the outyears)
8	Groundwater	well maintenance	351 Well Maintenance Crew	200.00	Team/Hr	$1,539	$307,721	OTHER	10	75	10	Monitoring well rehab every 10 years (10 hours per well) (assume 20 wells in the outyears)
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	2000.00	LF	$546	$1,092,000	OTHER	25	70	25	Monitoring well replacement every 25 years (20 * 100)
8	Groundwater	well maintenance	357 Decommission shallow well	20.00	LS	$2,500	$50,000	OTHER	25	70	25	decommission 20 wells for replacement
8	Groundwater	well maintenance	357 Decommission shallow well	20.00	LS	$2,500	$50,000	OTHER	75	75	1	final decommission of 20 wells
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	200	HR	$103	$20,618	OTHER	25	70	25	assume 10 ft per hour based on number of linear feet
8	Groundwater	well maintenance	371 Dispose of drill cuttings	261.92191	ton	$83	$21,740	OTHER	25	70	25	Monitoring well replacement every 25 years (5deep (200) + 5 shallow (100) + 10 deep (200)). Assume 2,900 lbs per cy. Shallow wells = 5.1611 cy, deep wells = 10.32202 cy

PERIODIC O&M MARKUPS

MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Contingency 15%	Contingency 10%	SUBTOTAL	Technical Support Services Percent	Technical Support Services Subtotal		SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$0	$3,960	$594	$396	**$4,950**	$426	**$5,376**	$806	$538	**$6,720**	45%	$3,024		**$9,743**	$1,949	$0
$0	$440	$66	$44	**$550**	$47	**$597**	$90	$60	**$747**	45%	$336		**$1,083**	$217	$0
$0	$2,260	$339	$226	**$2,825**	$243	**$3,068**	$460	$307	**$3,835**	45%	$1,726		**$5,561**	$1,112	$0
$0	$4,746	$712	$475	**$5,933**	$510	**$6,443**	$966	$644	**$8,053**	45%	$3,624		**$11,677**	$2,335	$0
$0	$10,508	$1,576	$1,051	**$13,134**	$1,130	**$14,264**	$2,140	$1,426	**$17,830**	45%	$8,023		**$25,853**	$5,171	$0
$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372		**$43,089**	$8,618	$0
$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372		**$43,089**	$8,618	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082		**$90,487**	$18,097	$0
$0	$924	$139	$92	**$1,155**	$99	**$1,254**	$188	$125	**$1,568**	45%	$706		**$2,273**	$455	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082		**$90,487**	$18,097	$0
$0	$89,980	$13,497	$8,998	**$112,475**	$9,673	**$122,148**	$18,322	$12,215	**$152,685**	33%	$50,386		**$203,071**	$40,614	$0
$0	$21,145	$3,172	$2,115	**$26,432**	$2,273	**$28,705**	$4,306	$2,870	**$35,881**	45%	$16,146		**$52,028**	$10,406	$0
$0	$307,721	$46,158	$30,772	**$384,651**	$0	**$384,651**	$57,698	$38,465	**$480,814**	33%	$158,668		**$639,482**	$127,896	$0
$0	$1,092,000	$163,800	$109,200	**$1,365,000**	$117,390	**$1,482,390**	$222,359	$148,239	**$1,852,988**	26%	$481,777		**$2,334,764**	$466,953	$0
$0	$50,000	$7,500	$5,000	**$62,500**	$5,375	**$67,875**	$10,181	$6,788	**$84,844**	45%	$38,180		**$123,023**	$24,605	$0
$0	$50,000	$7,500	$5,000	**$62,500**	$5,375	**$67,875**	$10,181	$6,788	**$84,844**	45%	$38,180		**$123,023**	$24,605	$0
$0	$20,618	$3,093	$2,062	**$25,773**	$2,216	**$27,989**	$4,198	$2,799	**$34,986**	45%	$15,744		**$50,730**	$10,146	$0
$0	$21,740	$3,261	$2,174	**$27,174**	$2,337	**$29,511**	$4,427	$2,951	**$36,889**	45%	$16,600		**$53,489**	$10,698	$0

Table B-2. Alternative 3 Cost Estimate Details

Alternative 03
NA with ICs, and RTD for Waste Sites; MNA with ICs for GW

Location:	100-BC-1, 100-BC-2, 100-BC-5	**Base Year:**	2016
Phase:	RI/FS	**Date:**	10/25/2016
Description:	Natural Attenuation with ICs, and RTD for Waste Sites; and Pump and Treat (P&T) and MNA with ICs for Groundwater		

CAPITAL COSTS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-		**Install 6 New Monitoring Wells**									
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	600	LF	$546	$327,600	0	0	1	6new wells = Assumes 6 shallow (100 ft) (new monitoring wells)
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	400	LF	$546	$218,400	6	6	1	4 new wells = assumes 4 shallow (100 ft) (new monitoring wells)
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	60	HR	$103	$6,185	0	0	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	40	HR	$103	$4,124	6	6	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	well drilling	295 Dispose of drill cuttings	44	ton	$83	$3,625	0	0	1	6 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy
8	Groundwater	well drilling	295 Dispose of drill cuttings	29	ton	$83	$2,417	6	6	1	4 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	6000	LF	$2	$9,000	6	6	1	4 wells, assumed 1,500 LF of power cable for each well
-		**Expansion of 100-KW P&T System**									
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	1	LS	$1,593,940	$1,593,940	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	1	LS	$2,343,434	$2,343,434	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$3	$0	0	0	1	3" HDPE Transfer Piping, ft (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$11	$0	0	0	1	8" HDPE Transfer Piping, ft (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	1050 Pipe Fusion Crew (includes testing)	0	team hr	$907	$0	0	0	1	pipe fusion crew to connect pipe lengths, test and place in trench (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	30 McElroy Fusion Machine	0	WK	$225	$0	0	0	1	pipeline fusion crew for time for use of fusion machine (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	100 Project Management Crew	0	Crew Hr	$386	$0	0	0	1	Project management at half time during excavation & pipe fusion (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	17 Freight for HDPE Pipe	0	trip	$2,500	$0	0	0	1	freight for pipe for extraction wells, 20 foot length with 54 pipes per load
-		**6 new extraction wells & associated piping & equipment**									
8	Groundwater	Extraction Wells	253 Extraction well(s)	800	LF	$535	$428,000	0	0	1	4 shallow (100') + 2 deep (200') (total of 6) - 8" diameter extraction wells
8	Groundwater	Extraction Wells	275 Pump Assembly	6	EA	$3,200	$19,200	0	0	1	6 pumps for 6 extraction wells
8	Groundwater	Extraction Wells	289 Landing Plate	6	EA	$350	$2,100	0	0	1	6 landing plates for 6 extraction wells
8	Groundwater	Extraction Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	riser pipe for each well
8	Groundwater	Extraction Wells	279 Disconnect Boxes	6	EA	$400	$2,400	0	0	1	6 disconnect boxes for 6 extraction wells
8	Groundwater	Extraction Wells	280 Allowance for Electrical Hookups	1	EA	$228	$228	0	0	1	1 allowance for electrical hookups for the 6 extraction wells
8	Groundwater	Extraction Wells	266 #10/4C THHN (tray cable)	800	LF	$2	$1,216	0	0	1	200 LF x 6 wells
8	Groundwater	Extraction Wells	285 Pump Setting Crew	60	Team/Hr	$529	$31,718	0	0	1	1 - 10 hour days per well x 6 wells
8	Groundwater	Extraction Wells	284 Extraction rack	6	EA	$150,000	$900,000	0	0	1	1 extraction well rack per well x 6 wells
8	Groundwater	Extraction Wells	10 Drilling Mobilization, completion, cleanup and demob	6	per well	$36,250	$217,500	0	0	1	drilling mob/demob etc per well x 6 wells
8	Groundwater	Extraction Wells	268 Water Level Sensor	6	EA	$1,200	$7,200	0	0	1	6 wells x 1 water level sensor
8	Groundwater	Extraction Wells	291 10000 Gallon Norwesco Plastic Potable Water Storage Tank	1	EA	$5,870	$5,870	0	0	1	1 - Influent collection tank, 10,000 gallons
8	Groundwater	Extraction Wells	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	5000	LF	$3	$16,400	0	0	1	3" HDPE Transfer Piping, ft
8	Groundwater	Extraction Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPE Transfer Piping, ft
8	Groundwater	Extraction Wells	1050 Pipe Fusion Crew (includes testing)	250	team hr	$907	$226,814	0	0	1	cost for fusion crew working on injection wells
8	Groundwater	Extraction Wells	30 McElroy Fusion Machine	6	WK	$225	$1,406	0	0	1	Pipe fusion machine
8	Groundwater	Extraction Wells	110 Excavation Crew (#42) Un-contaminated	250	Crew Hr	$904	$225,991	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)
8	Groundwater	Extraction Wells	100 Project Management Crew	125	Crew Hr	$386	$48,295	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)
8	Groundwater	Extraction Wells	17 Freight for HDPE Pipe	14	trip	$2,500	$34,722	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load
8	Groundwater	Extraction Wells	260 Fiber-optic cable and interfaces	10000	FT	$1	$13,300	0	0	1	Fiber Optic Cable
8	Groundwater	Extraction Wells	265 Transfer Station (extraction station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)
8	Groundwater	Extraction Wells	293 Fiber Optic Splice Box	4	EA	$1,000	$4,000	0	0	1	splice box every 2,500 running feet of fiber cable
8	Groundwater	Extraction Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	Extraction Wells	50 Globe Valve 3"	6	EA	$1,280	$7,679	0	0	1	1 ball valve per well x 6 wells
8	Groundwater	Extraction Wells	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well
8	Groundwater	Extraction Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	4 shallow (100')(5.1611 cy x 4) + 2 deep (200')(10.322cy x 2) (total of 6 wells) - 8" diameter extraction wells. 2,900 lbs/cy
-		**4 new injection wells & equipment & associated Piping**									
8	Groundwater	Injection Wells	292 SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size (*3.97" I.D.) x **20 ft.,	4000	LF	$3	$13,120	0	0	1	4" HDPE Transfer Piping, ft
8	Groundwater	Injection Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPETransfer Piping, ft
8	Groundwater	Injection Wells	1050 Pipe Fusion Crew (includes testing)	240	team hr	$907	$217,742	0	0	1	cost for fusion crew working on injection wells
8	Groundwater	Injection Wells	30 McElroy Fusion Machine	6	WK	$225	$1,350	0	0	1	Pipe fusion machine
8	Groundwater	Injection Wells	110 Excavation Crew (#42) Un-contaminated	240	Crew Hr	$904	$216,951	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)
8	Groundwater	Injection Wells	100 Project Management Crew	120	Crew Hr	$386	$46,363	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)
8	Groundwater	Injection Wells	17 Freight for HDPE Pipe	13	trip	$2,500	$32,407	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load

CAPITAL MARKUPS

DESCRIPTION		MDBI 10%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Project Management Percent	Project Management 5%	Remedial Design Percent	Remedial Design 6%	Construction Management Percent	Construction Management 6%	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
Install 6 New Monitoring Wells																				
11 Drilling & Construction (per foot)		$32,760	$360,360	$54,054	$36,036	**$450,450**	$38,739	**$489,189**	$73,378	$48,919	**$611,486**		$30,574		$36,689		$36,689	**$715,438**	$143,088	$0
11 Drilling & Construction (per foot)		$21,840	$240,240	$36,036	$24,024	**$300,300**	$25,826	**$326,126**	$48,919	$32,613	**$407,657**		$20,383		$24,459		$24,459	**$476,959**	$95,392	$0
294 Geologists/Geophysicists/Hydro - S030		$619	$6,804	$1,021	$680	**$8,505**	$731	**$9,236**	$1,385	$924	**$11,545**		$577		$693		$693	**$13,508**	$2,702	$0
294 Geologists/Geophysicists/Hydro - S030		$412	$4,536	$680	$454	**$5,670**	$488	**$6,158**	$924	$616	**$7,697**		$385		$462		$462	**$9,005**	$1,801	$0
295 Dispose of drill cuttings		$363	$3,988	$598	$399	**$4,985**	$429	**$5,414**	$812	$541	**$6,767**		$338		$406		$406	**$7,918**	$1,584	$0
295 Dispose of drill cuttings		$242	$2,659	$399	$266	**$3,323**	$286	**$3,609**	$541	$361	**$4,511**		$226		$271		$271	**$5,278**	$1,056	$0
51 Cable, 4/C #2 Type W		$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**		$1,260		$1,512		$1,512	**$29,482**	$5,896	$0
51 Cable, 4/C #2 Type W		$900	$9,900	$1,485	$990	**$12,375**	$1,064	**$13,439**	$2,016	$1,344	**$16,799**		$840		$1,008		$1,008	**$19,655**	$3,931	$0
Expansion of 100-KW P&T System																				
261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	0.05	$159,394	$1,753,334	$263,000	$175,333	**$2,191,668**	$0	**$2,191,668**	$328,750	$219,167	**$2,739,584**		$136,979		$164,375		$164,375	**$3,205,314**	$641,063	$0
262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	0.05	$234,343	$2,577,777	$386,667	$257,778	**$3,222,222**	$277,111	**$3,499,333**	$524,900	$349,933	**$4,374,166**		$218,708		$262,450		$262,450	**$5,117,774**	$1,023,555	$0
28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
1050 Pipe Fusion Crew (includes testing)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
30 McElroy Fusion Machine		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
110 Excavation Crew (#42) Un-contaminated		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
100 Project Management Crew		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
17 Freight for HDPE Pipe		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
6 new extraction wells & associated piping & equipment																				
253 Extraction well(s)		$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**		$39,944		$47,933		$47,933	**$934,700**	$186,940	$0
275 Pump Assembly		$1,920	$21,120	$3,168	$2,112	**$26,400**	$2,270	**$28,670**	$4,301	$2,867	**$35,838**		$1,792		$2,150		$2,150	**$41,930**	$8,386	$0
289 Landing Plate		$210	$2,310	$347	$231	**$2,888**	$248	**$3,136**	$470	$314	**$3,920**		$196		$235		$235	**$4,586**	$917	$0
271 Riser Pipe		$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**		$3,699		$4,439		$4,439	**$86,551**	$17,310	$0
279 Disconnect Boxes		$240	$2,640	$396	$264	**$3,300**	$284	**$3,584**	$538	$358	**$4,480**		$224		$269		$269	**$5,241**	$1,048	$0
280 Allowance for Electrical Hookups		$23	$251	$38	$25	**$314**	$27	**$340**	$51	$34	**$426**		$21		$26		$26	**$498**	$100	$0
266 #10/4C THHN (tray cable)		$122	$1,338	$201	$134	**$1,672**	$144	**$1,816**	$272	$182	**$2,270**		$113		$136		$136	**$2,656**	$531	$0
285 Pump Setting Crew		$3,172	$34,890	$5,233	$3,489	**$43,612**	$3,751	**$47,363**	$7,104	$4,736	**$59,204**		$2,960		$3,552		$3,552	**$69,268**	$13,854	$0
284 Extraction rack		$90,000	$990,000	$148,500	$99,000	**$1,237,500**	$106,425	**$1,343,925**	$201,589	$134,393	**$1,679,906**		$83,995		$100,794		$100,794	**$1,965,490**	$393,098	$0
10 Drilling Mobilization, completion, cleanup and demob		$21,750	$239,250	$35,888	$23,925	**$299,063**	$25,719	**$324,782**	$48,717	$32,478	**$405,977**		$20,299		$24,359		$24,359	**$474,993**	$94,999	$0
268 Water Level Sensor		$720	$7,920	$1,188	$792	**$9,900**	$851	**$10,751**	$1,613	$1,075	**$13,439**		$672		$806		$806	**$15,724**	$3,145	$0
291 10000 Gallon Norwesco Plastic Potable Water Storage Tank		$587	$6,457	$969	$646	**$8,071**	$694	**$8,765**	$1,315	$877	**$10,957**		$548		$657		$657	**$12,819**	$2,564	$0
28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)		$1,640	$18,040	$2,706	$1,804	**$22,550**	$1,939	**$24,489**	$3,673	$2,449	**$30,612**		$1,531		$1,837		$1,837	**$35,816**	$7,163	$0
29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)		$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**		$10,033		$12,039		$12,039	**$234,767**	$46,953	$0
1050 Pipe Fusion Crew (includes testing)		$22,681	$249,496	$37,424	$24,950	**$311,870**	$26,821	**$338,690**	$50,804	$33,869	**$423,363**		$21,168		$25,402		$25,402	**$495,335**	$99,067	$0
30 McElroy Fusion Machine		$141	$1,547	$232	$155	**$1,934**	$166	**$2,100**	$315	$210	**$2,625**		$131		$157		$157	**$3,071**	$614	$0
110 Excavation Crew (#42) Un-contaminated		$22,599	$248,590	$37,288	$24,859	**$310,737**	$26,723	**$337,461**	$50,619	$33,746	**$421,826**		$21,091		$25,310		$25,310	**$493,536**	$98,707	$0
100 Project Management Crew		$4,829	$53,124	$7,969	$5,312	**$66,405**	$5,711	**$72,116**	$10,817	$7,212	**$90,145**		$4,507		$5,409		$5,409	**$105,469**	$21,094	$0
17 Freight for HDPE Pipe		$3,472	$38,194	$5,729	$3,819	**$47,743**	$4,106	**$51,849**	$7,777	$5,185	**$64,811**		$3,241		$3,889		$3,889	**$75,829**	$15,166	$0
260 Fiber-optic cable and interfaces		$1,330	$14,630	$2,195	$1,463	**$18,288**	$1,573	**$19,860**	$2,979	$1,986	**$24,825**		$1,241		$1,490		$1,490	**$29,046**	$5,809	$0
265 Transfer Station (extraction station)		$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**		$75,147		$90,177		$90,177	**$1,758,450**	$351,690	$0
293 Fiber Optic Splice Box		$400	$4,400	$660	$440	**$5,500**	$473	**$5,973**	$896	$597	**$7,466**		$373		$448		$448	**$8,736**	$1,747	$0
294 Geologists/Geophysicists/Hydro - S030		$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**		$770		$924		$924	**$18,011**	$3,602	$0
50 Globe Valve 3"		$768	$8,447	$1,267	$845	**$10,558**	$908	**$11,466**	$1,720	$1,147	**$14,333**		$717		$860		$860	**$16,770**	$3,354	$0
51 Cable, 4/C #2 Type W		$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**		$1,260		$1,512		$1,512	**$29,482**	$5,896	$0
295 Dispose of drill cuttings		$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**		$464		$557		$557	**$10,852**	$2,170	$0
4 new injection wells & equipment & associated Piping																				
292 SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size		$1,312	$14,432	$2,165	$1,443	**$18,040**	$1,551	**$19,591**	$2,939	$1,959	**$24,489**		$1,224		$1,469		$1,469	**$28,652**	$5,730	$0
29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)		$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**		$10,033		$12,039		$12,039	**$234,767**	$46,953	$0
1050 Pipe Fusion Crew (includes testing)		$21,774	$239,516	$35,927	$23,952	**$299,395**	$25,748	**$325,143**	$48,771	$32,514	**$406,428**		$20,321		$24,386		$24,386	**$475,521**	$95,104	$0
30 McElroy Fusion Machine		$135	$1,485	$223	$149	**$1,856**	$160	**$2,016**	$302	$202	**$2,520**		$126		$151		$151	**$2,948**	$590	$0
110 Excavation Crew (#42) Un-contaminated		$21,695	$238,646	$35,797	$23,865	**$298,308**	$25,654	**$323,962**	$48,594	$32,396	**$404,953**		$20,248		$24,297		$24,297	**$473,795**	$94,759	$0
100 Project Management Crew		$4,636	$50,999	$7,650	$5,100	**$63,749**	$5,482	**$69,231**	$10,385	$6,923	**$86,539**		$4,327		$5,192		$5,192	**$101,251**	$20,250	$0
17 Freight for HDPE Pipe		$3,241	$35,648	$5,347	$3,565	**$44,560**	$3,832	**$48,392**	$7,259	$4,839	**$60,490**		$3,025		$3,629		$3,629	**$70,774**	$14,155	$0

8	Groundwater	Injection Wells	254 Injection Well(s)	800	LF	$535	$428,000	0	0	1	4 injection wells drilled down to 200 LF		$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**	$39,944	$47,933	$47,933	**$934,700**	$186,940	$0
8	Groundwater	Injection Wells	264 Transfer Station (injection station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)		$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Injection Wells	289 Landing Plate	4	EA	$350	$1,400	0	0	1	4 landing plates, 1 for each injection well		$140	$1,540	$231	$154	**$1,925**	$166	**$2,091**	$314	$209	**$2,613**	$131	$157	$157	**$3,057**	$611	$0
8	Groundwater	Injection Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	200 LF x 4 injection wells		$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**	$3,699	$4,439	$4,439	**$86,551**	$17,310	$0
8	Groundwater	Injection Wells	285 Pump Setting Crew	40	Team/Hr	$529	$21,145	0	0	1	10 hours per well x 4 wells for injection wells (using pump setting crew to cost installation of injection racks)		$2,115	$23,260	$3,489	$2,326	**$29,075**	$2,500	**$31,575**	$4,736	$3,158	**$39,469**	$1,973	$2,368	$2,368	**$46,179**	$9,236	$0
8	Groundwater	Injection Wells	283 Injection Rack	4	EA	$40,000	$160,000	0	0	1	1 injection rack per injection well x 4 wells		$16,000	$176,000	$26,400	$17,600	**$220,000**	$18,920	**$238,920**	$35,838	$23,892	**$298,650**	$14,933	$17,919	$17,919	**$349,421**	$69,884	$0
8	Groundwater	Injection Wells	10 Drilling Mobilization, completion, cleanup and demob	4	per well	$36,250	$145,000	0	0	1	4 wells x mob/demob of crew		$14,500	$159,500	$23,925	$15,950	**$199,375**	$17,146	**$216,521**	$32,478	$21,652	**$270,652**	$13,533	$16,239	$16,239	**$316,662**	$63,332	$0
8	Groundwater	Injection Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	assume 10 ft per hour based on number of linear feet		$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**	$770	$924	$924	**$18,011**	$3,602	$0
8	Groundwater	Injection Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	4 deep (200')(10.322cy x 4) - 8" diameter extraction wells. 2,900 lbs/cy		$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**	$464	$556	$556	**$10,852**	$2,170	$0
-			**Excavation - site 118-B-8:4**																									
5	118-B-8:4	Excavation	111 Excavation Crew (#43) Contaminated	0	Crew Hr	$1,223	$0	0	0	1	excavation during contaminated areas based on cy/60hrs		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	0	0	1	excavator time based on crew time for excavating contaminated soil		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	113 Excavator (Un-contaminated)	0	MO	$5,200	$0	0	0	1	excavator time based on crew time for excavating non contaminated soil		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	0	EA	$165	$0	0	0	1	analytical during excavaion to verify clean based on SF/6724		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
-			**ERDF Disposal & Backfill - site 118-B-8:4**																									
5	118-B-8:4	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	0	EA	$497	$0	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	89.699	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	811 ERDF WG	0	Ton	$83	$0	0	0	1	CY of contaminated soild going to ERDF		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	133 Backfill and soil cover crew (#46)	0	Crew Hr	$1,359	$0	0	0	1	backfill crew based on cy/185		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	112 DumpTrucks	0	MO	$6,200	$0	0	0	1	Trucks from borrow pit		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	134 Front End Loader	0	MO	$15,500	$0	0	0	1	front end loader to deliver and sprad backfill soil		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	137 Water Truck	0	MO	$6,200	$0	0	0	1	water truck		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	139 Revegetate area	0	Ac	$5,010	$0	0	0	1	revegetate area		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4						$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$0	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	0	HR	$70	$0	0	0	1	truck drivers		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	0	HR	$70	$0	0	0	1	operators for water truck and front end loader		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	118 Fuel - Diesel	0	gal	$4	$0	0	0	1	fuel delivery		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	119 Fuel Delivery	0	gal	$2	$0	0	0	1	fuel		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
-			**Excavation - site 100-B-34 Dichromate Transfer Line**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	110 Excavation Crew (#42) Un-contaminated	87	Crew Hr	$904	$79,046	0	0	1			$7,905	$86,951	$13,043	$8,695	**$108,689**	$9,347	**$118,036**	$17,705	$11,804	**$147,545**	$7,377	$8,853	$8,853	**$172,628**	$34,526	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	111 Excavation Crew (#43) Contaminated	4	Crew Hr	$1,223	$5,301	0	0	1			$530	$5,831	$875	$583	**$7,288**	$627	**$7,915**	$1,187	$792	**$9,894**	$495	$594	$594	**$11,576**	$2,315	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$2,983	0	0	1			$298	$3,281	$492	$328	**$4,101**	$353	**$4,454**	$668	$445	**$5,568**	$278	$334	$334	**$6,514**	$1,303	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	05 OPERATOR GROUP VIII	92	HR	$70	$6,420	0	0	1	operators for the excavator		$642	$7,062	$1,059	$706	**$8,828**	$759	**$9,587**	$1,438	$959	**$11,984**	$599	$719	$719	**$14,021**	$2,804	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	145 Move water main	0	LS	$1,200,000	$420,000	0	0	1	Move fire supression line above dichromate transfer lines		$42,000	$462,000	$69,300	$46,200	**$577,500**	$49,665	**$627,165**	$94,075	$62,717	**$783,956**	$39,198	$47,037	$47,037	**$917,229**	$183,446	$0
-			**Sampling & Analysis: 100-B-34 - Dichromate Transfer Line**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for dichromate (2 hours per sample)		$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**	$82	$98	$98	**$1,912**	$382	$0
2	100-B-34 (Dichromate Transfer Line)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1			$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-			**Backfill & Disposal: 100-B-34 - Dichromate Transfer Line**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	133 Backfill and soil cover crew (#46)	203	Crew Hr	$1,359	$276,493	0	0	1	backfill crew, assume LCY/185 hrs (dichromate transfer line)		$27,649	$304,142	$45,621	$30,414	**$380,178**	$32,695	**$412,873**	$61,931	$41,287	**$516,091**	$25,805	$30,965	$30,965	**$603,827**	$120,765	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (dichromate transfer line)		$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	811 ERDF WG	19	Ton	$83	$1,616	0	0	1			$162	$1,778	$267	$178	**$2,222**	$191	**$2,413**	$362	$241	**$3,016**	$151	$181	$181	**$3,529**	$706	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	112 DumpTrucks	1	MO	$6,200	$3,556	0	0	1			$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	134 Front End Loader	1	MO	$15,500	$8,891	0	0	1			$889	$9,780	$1,467	$978	**$12,225**	$1,051	**$13,276**	$1,991	$1,328	**$16,596**	$830	$996	$996	**$19,417**	$3,883	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	137 Water Truck	1	MO	$6,200	$3,556	0	0	1			$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	139 Revegetate area	0	Ac	$5,010	$1,953	0	0	1			$195	$2,148	$322	$215	**$2,685**	$231	**$2,916**	$437	$292	**$3,645**	$182	$219	$219	**$4,264**	$853	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	819 Survey Tent	0	LS	$120,000	$42,000	0	0	1			$4,200	$46,200	$6,930	$4,620	**$57,750**	$4,967	**$62,717**	$9,407	$6,272	**$78,396**	$3,920	$4,704	$4,704	**$91,723**	$18,345	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$69	0	0	1			$7	$76	$11	$8	**$95**	$0	**$95**	$14	$10	**$119**	$6	$7	$7	**$140**	$28	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	120 Fuel Charge	203.40	Hr	$16	$3,336	0	0	1			$334	$3,669	$550	$367	**$4,587**	$394	**$4,981**	$747	$498	**$6,226**	$311	$374	$374	**$7,285**	$1,457	$0
-			**Expansion of 100-KW P&T System Prior to Startup**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	0.25	LS	$1,593,940	$398,485	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)		$39,849	$438,334	$65,750	$43,833	**$547,917**	$0	**$547,917**	$82,188	$54,792	**$684,896**	$34,245	$41,094	$41,094	**$801,328**	$160,266	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	0.25	LS	$2,343,434	$585,859	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)		$58,586	$644,444	$96,667	$64,444	**$805,555**	$69,278	**$874,833**	$131,225	$87,483	**$1,093,542**	$54,677	$65,612	$65,612	**$1,279,444**	$255,889	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	296 pH Adjustment	1	EA	$610,000	$610,000	0	0	1	Cost for adding pH adjustment capability to 100-KW P&T		$61,000	$671,000	$100,650	$67,100	**$838,750**	$72,133	**$910,883**	$136,632	$91,088	**$1,138,603**	$56,930	$68,316	$68,316	**$1,332,166**	$266,433	$0
-													$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0

ANNUAL O&M COST

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-		**100-B-34 Institutional Controls & Site Closeout (Deep Contamination)**									
1	100-B-34 (Radioactive Process sewer)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	site visits 1 per year, ICs until 2055
1	100-B-34 (Radioactive Process sewer)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	Site closeout-final report for radioactive process sewer portion of 100-B-34 in 2055
-		**116-C-1 Institutional Controls & Site Closeout (Deep Contamination)**									
3	116-C-1	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	150	1	site visits once a year, ICs includes writing a brief report. No dig ICs ending in 2485, No irrigation ICs ending in 2034 (469 years)
3	116-C-1	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	Final report (2485)
-		**118-B-1 Institutional Controls & Site Closeout (Deep Contamination)**									
4	118-B-1 (burial grd)	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	65	1	Site visits once a year, ICs 2040 (shallow), 2081 (deep), and no irrigation IC until 2049
4	118-B-1 (burial grd)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	65	65	1	Site Closeout-final report 2081
-		**Institutional Controls, & Site Closeout**									
6	116-B-5 (crib)	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	5	1	Site visits, 1 per year until 2021, assume MNA monitoring is associated with these site visits (9 years)
6	116-B-5 (crib)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	5	5	1	2021 - site closeout
-		**116-B-6A Institutional Controls, & Site Closeout (Deep Contamination)**									
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	79	1	Site visits, 1 per year until 2095. Excavation ICs until year 2045 (shallow)
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	79	79	1	2095 - site closeout
-		**MNA & ICs for Groundwater**									
8	Groundwater	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	75	1	Institutional controls for 75 years starting in 2016
-		**P&T for 40 years**									
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	356 100 KX Pump & Treat Operating Cost	1	per year	$129,524	$129,524	0	40	1	pump & treat annual cost for 100BC @ 400 gpm for 40 years, (P&T 400 gpm for 40 years; send to KR4 (200 gpm) and KW or KX (200 gpm)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	355 100KX resin cost	207,360,000	per gal	$0.00080	$165,888	0	40	1	resin cost per year, see backup cost tab for more info, "BKUP" (207,360,000 gallons per year is number of gallons at 400gpm)
-		**MNA - sampling first year (existing wells)**									
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	32	EA	$165	$5,280	1	1	1	annual sampling at 32 existing wells
8	Groundwater	MNA	02 Sampling Crew	64	team/hr	$438	$28,020	1	1	1	annual sampling at 32 existing wells (2 hours per well)
-		**MNA - sampling 2 - 5 years**									
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	38	EA	$165	$6,270	2	5	1	annual sampling of 38 wells (new + existing)
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	2	5	1	annual sampling of 38 wells (new + existing) (2 hours per sample)
-		**MNA - sampling 6 - 10 years**									
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	42	EA	$165	$6,930	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90)
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90) (2 hours per well for sampling)
-		**P&T Maintenance**									
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	400	gpm	$2,187	$874,800	1	40	1	Annual maintenance of P&T system
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	40	gpm	$2,187	$87,480	1	40	1	Annual cost for pH adjustment
-		**MNA - sampling 1 - 5 years (every 5 years)**									
8	Groundwater	MNA	21 Tritium - Low Level (water)	0	EA	$90	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for tritium)
8	Groundwater	MNA	02 Sampling Crew	0	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken
8	Groundwater	MNA	22 VOCs (Chloroform, TCE) water	0.00	EA	$79	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for TCE and chloroform)
8	Groundwater	MNA	02 Sampling Crew	0.00	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken
-		**118-B-8:4 Insitutional Controls & Site Closeout (Deep Contamination)**									
5	118-B-8:4	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	Site visits, 1 per year for 187 years, assume MNA monitoring is associated with these site visits (187 years) for shallow soils, ICs until 32021 for deep soil
5	118-B-8:4	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	Closout report at year 32021 of MNA
-		**MNA - sampling Tritium**									
8	Groundwater	MNA	21 Tritium - Low Level (water)	1	EA	$90	$90	1	34	1	Sample 1 well each year for the first 34 years.
8	Groundwater	MNA	02 Sampling Crew	2	team/hr	$438	$876	1	34	1	Sample 1 well each year for the first 34 years, 2 hours per sample.
8	Groundwater	MNA	21 Tritium - Low Level (water)	38	EA	$90	$3,420	35	40	1	Sample 32 existing and 6 new wells.
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	35	40	1	Sample 32 existing and 6 new wells, 2 hours per sample
-		**ICs & Site Closeout - 23 Deep ROM Sites**									
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	67	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	49	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.

ANNUAL O&M MARKUPS

MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Technical Support Services Percent	Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$129,524	$19,429	$12,952	**$161,905**	$13,924	**$175,829**	$26,374	$17,583	**$219,786**	33%	$72,529	**$292,315**	$58,463	$0
$0	$165,888	$24,883	$16,589	**$207,360**	$17,833	**$225,193**	$33,779	$22,519	**$281,491**	33%	$92,892	**$374,383**	$74,877	$0
$0	$5,280	$792	$528	**$6,600**	$568	**$7,168**	$1,075	$717	**$8,960**	45%	$4,032	**$12,991**	$2,598	$0
$0	$28,020	$4,203	$2,802	**$35,025**	$3,012	**$38,037**	$5,706	$3,804	**$47,547**	45%	$21,396	**$68,942**	$13,788	$0
$0	$6,270	$941	$627	**$7,838**	$674	**$8,512**	$1,277	$851	**$10,639**	45%	$4,788	**$15,427**	$3,085	$0
$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
$0	$6,930	$1,040	$693	**$8,663**	$745	**$9,407**	$1,411	$941	**$11,759**	45%	$5,292	**$17,051**	$3,410	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
$0	$874,800	$131,220	$87,480	**$1,093,500**	$94,041	**$1,187,541**	$178,131	$118,754	**$1,484,426**	26%	$385,951	**$1,870,377**	$374,075	$0
$0	$87,480	$13,122	$8,748	**$109,350**	$9,404	**$118,754**	$17,813	$11,875	**$148,443**	33%	$48,986	**$197,429**	$39,486	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$90	$14	$9	**$113**	$10	**$122**	$18	$12	**$153**	45%	$69	**$221**	$44	$0
$0	$876	$131	$88	**$1,095**	$94	**$1,189**	$178	$119	**$1,486**	45%	$669	**$2,154**	$431	$0
$0	$3,420	$513	$342	**$4,275**	$368	**$4,643**	$696	$464	**$5,803**	45%	$2,611	**$8,415**	$1,683	$0
$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	14	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	59	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	136	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	93	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	121	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	26	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

PERIODIC O&M COST												PERIODIC O&M MARKUPS														
												MDBI		Overhead	Profit		Sales Tax		Contingency			Technical Support Services			CHPRC G&A	Institutional
SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES	0%	SUBTOTAL	15%	10%	SUBTOTAL	8.6%	SUBTOTAL	15%	10%	SUBTOTAL	Percent	Subtotal	SUBTOTAL	20.00%	Controls
-			**MNA - sampling first year (new wells)**																							
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	24	EA	$165	$3,960	0	0	1	First year, quarterly sampling in the 6 new wells	$0	$3,960	$594	$396	**$4,950**	$426	**$5,376**	$806	$538	**$6,720**	45%	$3,024	**$9,743**	$1,949	$0
8	Groundwater	MNA	02 Sampling Crew	48	team/hr	$438	$21,015	0	0	1	First year, quarterly sampling in the 6 new wells (assume 2 hours per sample)	$0	$21,015	$3,152	$2,102	**$26,269**	$2,259	**$28,528**	$4,279	$2,853	**$35,660**	45%	$16,047	**$51,707**	$10,341	$0
-			**MNA - sampling out years 11 - 40 for hex chromium**																							
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	20	EA	$22	$440	11	40	2	Samples/Event (Out Years) [Years 11-40] 30 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$440	$66	$44	**$550**	$47	**$597**	$90	$60	**$747**	45%	$336	**$1,083**	$217	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	40	2	Samples/Event (Out Years) [Years 11-40] 30 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium) (2 hours per well for sampling)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
-			**MNA - sampling out years 41 - 45 for hex chromium (post remedy)**																							
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	42	EA	$22	$924	41	45	1	Samples/Event (Out Years) [Years 41-45] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$924	$139	$92	**$1,155**	$99	**$1,254**	$188	$125	**$1,568**	45%	$706	**$2,273**	$455	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	41	45	1	Samples/Event (Out Years) [Years 41-45] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium) (2 hours per well for sampling)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-			**MNA - sampling out years 11 - 70 for strantium-90**																							
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	20.00	EA	$113	$2,260	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$2,260	$339	$226	**$2,825**	$243	**$3,068**	$460	$307	**$3,835**	45%	$1,726	**$5,561**	$1,112	$0
8	Groundwater	MNA	02 Sampling Crew	40.00	team/hr	$438	$17,513	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90) (2 hours per well for sampling)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
-			**MNA - sampling out years 71 - 75 for strantium-90 (post remedy)**																							
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	42	EA	$113	$4,746	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$4,746	$712	$475	**$5,933**	$510	**$6,443**	$966	$644	**$8,053**	45%	$3,624	**$11,677**	$2,335	$0
8	Groundwater	MNA	02 Sampling Crew	84.00	team/hr	$438	$36,776	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90) (2 hours per well for sampling)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-			**Extraction Wells maintenance**																							
8	Groundwater	well maintenance	350 Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	6	EA	$4,499	$26,994	5	35	5	replacing pumps in extraction wells every 5 years	$0	$26,994	$4,049	$2,699	**$33,743**	$2,902	**$36,644**	$5,497	$3,664	**$45,805**	45%	$20,612	**$66,418**	$13,284	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	12	Crew Hr	$529	$6,344	5	35	5	replacing pumps in extraction wells every 5 years, assume 2 hours per well to replace pumps	$0	$6,344	$952	$634	**$7,930**	$682	**$8,611**	$1,292	$861	**$10,764**	45%	$4,844	**$15,608**	$3,122	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$436,800	25	40	25	replace extraction wells every 25 years	$0	$436,800	$65,520	$43,680	**$546,000**	$46,956	**$592,956**	$88,943	$59,296	**$741,195**	26%	$192,711	**$933,906**	$186,781	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	30.00	Team/Hr	$1,539	$46,158	5	40	5	5 hours per well (extraction) every 5 years to maintain the wells	$0	$46,158	$6,924	$4,616	**$57,698**	$0	**$57,698**	$8,655	$5,770	**$72,122**	45%	$32,455	**$104,577**	$20,915	$0
8	Groundwater	well maintenance	359 Decommission deep well	2.00	LS	$3,500	$7,000	25	40	25	decommission wells (deep)	$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$10,000	25	40	25	decommission wells (shallow)	$0	$10,000	$1,500	$1,000	**$12,500**	$1,075	**$13,575**	$2,036	$1,358	**$16,969**	45%	$7,636	**$24,605**	$4,921	$0
8	Groundwater	well maintenance	359 Decommission deep well	2.00	LS	$3,500	$7,000	45	45	1	final decommission wells (deep)	$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$10,000	45	45	1	final decommission wells (shallow)	$0	$10,000	$1,500	$1,000	**$12,500**	$1,075	**$13,575**	$2,036	$1,358	**$16,969**	45%	$7,636	**$24,605**	$4,921	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80.00	HR	$103	$8,247	25	40	25	replace extraction wells every 25 years	$0	$8,247	$1,237	$825	**$10,309**	$887	**$11,196**	$1,679	$1,120	**$13,994**	45%	$6,298	**$20,292**	$4,058	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	89.80	ton	$83	$7,454	25	40	25	replace extraction wells every 25 years	$0	$7,454	$1,118	$745	**$9,317**	$801	**$10,118**	$1,518	$1,012	**$12,648**	45%	$5,691	**$18,339**	$3,668	$0
-			**Injection Wells maintenance**																							
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$436,800	15	40	15	replace injection wells every 15 years	$0	$436,800	$65,520	$43,680	**$546,000**	$46,956	**$592,956**	$88,943	$59,296	**$741,195**	26%	$192,711	**$933,906**	$186,781	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	20	Team/Hr	$1,539	$30,772	2	44	2	5 hours per well (injection) every 2 years to maintain the wells	$0	$30,772	$4,616	$3,077	**$38,465**	$0	**$38,465**	$5,770	$3,847	**$48,081**	45%	$21,637	**$69,718**	$13,944	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	15	40	15	Decommission Injection Wells every 15 years with replacement	$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	45	45	1	final Decommission Injection Wells	$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	15	40	15	replace injection wells every 15 years	$0	$8,247	$1,237	$825	**$10,309**	$887	**$11,196**	$1,679	$1,120	**$13,994**	45%	$6,298	**$20,292**	$4,058	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	60	ton	$83	$4,969	15	40	15	replace injection wells every 15 years	$0	$4,969	$745	$497	**$6,211**	$534	**$6,745**	$1,012	$675	**$8,432**	45%	$3,794	**$12,226**	$2,445	$0
-			**Monitor Wells maintenance**																							
8	Groundwater	well maintenance	368 Grundfos MW Pump - 10 gpm, 2" pump	20	EA	$1,500	$30,000	10	75	10	20 wells, replacing pumps every 10 years, assume 2 hours per well to replace pumps (monitoring wells)	$0	$30,000	$4,500	$3,000	**$37,500**	$3,225	**$40,725**	$6,109	$4,073	**$50,906**	45%	$22,908	**$73,814**	$14,763	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	40	Crew Hr	$529	$21,145	10	75	10	Monitoring well pump replacement (2 hours per well) (assume 20 wells in the outyears)	$0	$21,145	$3,172	$2,115	**$26,432**	$2,273	**$28,705**	$4,306	$2,870	**$35,881**	45%	$16,146	**$52,028**	$10,406	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	200.00	Team/Hr	$1,539	$307,721	10	75	10	Monitoring well rehab every 10 years (10 hours per well) (assume 20 wells in the outyears)	$0	$307,721	$46,158	$30,772	**$384,651**	$0	**$384,651**	$57,698	$38,465	**$480,814**	33%	$158,668	**$639,482**	$127,896	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	2000.00	LF	$546	$1,092,000	25	70	25	Monitoring well replacement every 25 years - 20 wells	$0	$1,092,000	$163,800	$109,200	**$1,365,000**	$117,390	**$1,482,390**	$222,359	$148,239	**$1,852,988**	26%	$481,777	**$2,334,764**	$466,953	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	25	70	25	decommission 20 wells for replacement	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
8	Groundwater	well maintenance	359 Decommission deep well	20.00	LS	$3,500	$70,000	75	75	1	final decommission of 20 wells	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	200.00	HR	$103	$20,618	25	70	25	Monitoring well replacement every 25 years. 20 wells, assume 1 hr per 10 LF for geologist.	$0	$20,618	$3,093	$2,062	**$25,773**	$2,216	**$27,989**	$4,198	$2,799	**$34,986**	45%	$15,744	**$50,730**	$10,146	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	261.92191	ton	$83	$21,740	25	70	25	Monitoring well replacement every 25 years. 20 wells. Assume 2,900 lbs per cy. Shallow wells = 5.1611 cy, deep wells = 10.32202 cy	$0	$21,740	$3,261	$2,174	**$27,174**	$2,337	**$29,511**	$4,427	$2,951	**$36,889**	45%	$16,600	**$53,489**	$10,698	$0
-			**Refurbishment of 100-KW P&T System Prior to Startup**									$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	375 100-KW refurbishment	1.00	EA	$984,344	$984,344	25	25	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$0	$984,344	$147,652	$98,434	**$1,230,429**	$105,817	**$1,336,246**	$200,437	$133,625	**$1,670,308**	26%	$434,280	**$2,104,588**	$420,918	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	376 100-KW piping refurbishment	1.00	EA	$12,390	$12,390	25	25	1	10% of 10,000 ft piping costs	$0	$12,390	$1,859	$1,239	**$15,488**	$1,332	**$16,819**	$2,523	$1,682	**$21,024**	45%	$9,461	**$30,485**	$6,097	$0

Table B-3. Alternative 4 Cost Estimate Details

Alternative 04
NA with ICs, and Aggressive RTD for Waste Sites; and P&T and MNA with ICs for GW

Location:	100-BC-1, 100-BC-2, 100-BC-5	**Base Year:**	2016
Phase:	RI/FS	**Date:**	10/25/2016
Description:	Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and P&T and MNA with ICs for Groundwater		

CAPITAL COSTS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-			**Excavation - Site 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Excavation	110 Excavation Crew (#42) Un-contaminated	153	Crew Hr	$904	$138,267	0	0	1	2 - 50 foot segments of pipe reroute water lines, non contaminated soil removal
1	100-B-34 (Radioactive Process sewer)	Excavation	111 Excavation Crew (#43) Contaminated	2	Crew Hr	$1,223	$1,953	0	0	1	2 - 50 foot segments of pipe reroute water lines, non contaminated soil removal
1	100-B-34 (Radioactive Process sewer)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$5,023	0	0	1	excavator per month based on crew hours for the 2 - 50 foot pipes
2	100-B-34 (Dichromate Transfer Line)	Excavation	110 Excavation Crew (#42) Un-contaminated	87	Crew Hr	$904	$79,046	0	0	1	1 - 55 ft pipe segment 6 ft below ground
2	100-B-34 (Dichromate Transfer Line)	Excavation	111 Excavation Crew (#43) Contaminated	4	Crew Hr	$1,223	$5,301	0	0	1	1 - 55 ft pipe segment 6 ft below ground (assume a minum of 5 hours)
2	100-B-34 (Dichromate Transfer Line)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$2,983	0	0	1	excavator per month based on crew hours for the 1 - 55 foot pipes
1	100-B-34 (Radioactive Process sewer)	Excavation	118 Fuel - Diesel	118	gal	$4	$431	0	0	1	excavator fuel (assume 3.1 gph)
1	100-B-34 (Radioactive Process sewer)	Excavation	119 Fuel Delivery	118	gal	$2	$210	0	0	1	fuel delivery
1	100-B-34 (Radioactive Process sewer)	Excavation	05 OPERATOR GROUP VIII	155	HR	$70	$10,812	0	0	1	operators for the excavators for both radioactive process sewer
1	100-B-34 (Radioactive Process sewer)	Excavation	145 Move water main	1	LS	$1,200,000	$780,000	0	0	1	Move water main above sewer lines. Assumes radioactive process sewer is 65% of the cost
-			**Sampling & Analysis: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for 2 lines (2 hours per sample)
2	100-B-34 (Dichromate Transfer Line)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for dichromate (2 hours per sample)
1	100-B-34 (Radioactive Process sewer)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analysis for 2 lines
2	100-B-34 (Dichromate Transfer Line)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analysis for dichromate line
-			**Backfill: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Excavation	133 Backfill and soil cover crew (#46)	133	Crew Hr	$1,359	$180,532	0	0	1	backfill crew, assume LCY/185 hrs (2 segments of pipe)
2	100-B-34 (Dichromate Transfer Line)	Excavation	133 Backfill and soil cover crew (#46)	203	Crew Hr	$1,359	$276,493	0	0	1	backfill crew, assume LCY/185 hrs (dichromate transfer line)
-			**ERDF Disposal: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (2 segments)
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (dichromate transfer line)
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	811 ERDF WG	125	Ton	$83	$10,339	0	0	1	disposal of soil from 2 - pipe segments
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	811 ERDF WG	19	Ton	$83	$1,616	0	0	1	disposal of soil from dichromate transfer line
-			**Excavation - Site 116-C-1**								
3	116-C-1	Excavation	118 Fuel - Diesel	594	gal	$4	$2,181	0	0	1	fuel
3	116-C-1	Excavation	119 Fuel Delivery	594	gal	$2	$1,064	0	0	1	fuel delivery
3	116-C-1	Excavation	111 Excavation Crew (#43) Contaminated	1,647	Crew Hr	$1,223	$2,014,015	0	0	1	excavation during contaminated areas based on cy/60hrs
3	116-C-1	Excavation	110 Excavation Crew (#42) Un-contaminated	1,920	Crew Hr	$904	$1,735,340	0	0	1	excavation during uncontaminated areas based on cy/180hrs
3	116-C-1	Excavation	114 Excavator (Contaminated)	10	MO	$5,200	$53,512	0	0	1	excavator time based on crew time for excavating contaminated soil
3	116-C-1	Excavation	113 Excavator (Un-contaminated)	12	MO	$5,200	$62,390	0	0	1	excavator time based on crew time for excavating non contaminated soil
3	116-C-1	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	18	EA	$165	$2,936	0	0	1	analytical during excavaion to verify clean based on SF/6724
-			**ERDF Disposal & Backfill - Site 116-C-1**								
3	116-C-1	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	99	EA	$497	$49,099	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification
3	116-C-1	ERDF Disposal	811 ERDF WG	128,428	Ton	$83	$10,659,534	0	0	1	CY of contaminated soild going to ERDF
3	116-C-1	Backfill	133 Backfill and soil cover crew (#46)	2,194	Crew Hr	$1,359	$2,982,872	0	0	1	backfill crew based on cy/185
3	116-C-1	Backfill	05 OPERATOR GROUP VIII	2194	HR	$70	$153,498	0	0	1	truck drivers
3	116-C-1	Backfill	112 DumpTrucks	14	MO	$6,200	$85,029	0	0	1	Trucks from borrow pit
3	116-C-1	Backfill	134 Front End Loader	36	MO	$15,500	$558,049	0	0	1	front end loader to deliver and spread backfill soil
3	116-C-1	Backfill	137 Water Truck	36	MO	$6,200	$223,220	0	0	1	water truck (entire length of project)

CAPITAL MARKUPS

SITE	SITE NAME	DESCRIPTION	QTY	MDBI 10%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Project Management Percent	5%	Remedial Design Percent	6%	Construction Management Percent	6%	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
1	100-B-34 (Radioactive Process sewer)	110 Excavation Crew (#42) Un-contaminated	153	$13,827	$152,094	$22,814	$15,209	**$190,117**	$16,350	**$206,467**	$30,970	$20,647	**$258,084**		$12,904		$15,485		$15,485	**$301,959**	$60,392	$0
1	100-B-34 (Radioactive Process sewer)	111 Excavation Crew (#43) Contaminated	2	$195	$2,149	$322	$215	**$2,686**	$231	**$2,917**	$438	$292	**$3,646**		$182		$219		$219	**$4,266**	$853	$0
1	100-B-34 (Radioactive Process sewer)	113 Excavator (Un-contaminated)	1	$502	$5,525	$829	$553	**$6,907**	$594	**$7,501**	$1,125	$750	**$9,376**		$469		$563		$563	**$10,970**	$2,194	$0
2	100-B-34 (Dichromate Transfer Line)	110 Excavation Crew (#42) Un-contaminated	87	$7,905	$86,951	$13,043	$8,695	**$108,689**	$9,347	**$118,036**	$17,705	$11,804	**$147,545**		$7,377		$8,853		$8,853	**$172,628**	$34,526	$0
2	100-B-34 (Dichromate Transfer Line)	111 Excavation Crew (#43) Contaminated	4	$530	$5,831	$875	$583	**$7,288**	$627	**$7,915**	$1,187	$792	**$9,894**		$495		$594		$594	**$11,576**	$2,315	$0
2	100-B-34 (Dichromate Transfer Line)	113 Excavator (Un-contaminated)	1	$298	$3,281	$492	$328	**$4,101**	$353	**$4,454**	$668	$445	**$5,568**		$278		$334		$334	**$6,514**	$1,303	$0
1	100-B-34 (Radioactive Process sewer)	118 Fuel - Diesel	118	$43	$474	$71	$47	**$593**	$51	**$644**	$97	$64	**$805**		$40		$48		$48	**$942**	$188	$0
1	100-B-34 (Radioactive Process sewer)	119 Fuel Delivery	118	$21	$231	$35	$23	**$289**	$25	**$314**	$47	$31	**$393**		$20		$24		$24	**$459**	$92	$0
1	100-B-34 (Radioactive Process sewer)	05 OPERATOR GROUP VIII	155	$1,081	$11,893	$1,784	$1,189	**$14,866**	$1,278	**$16,144**	$2,422	$1,614	**$20,181**		$1,009		$1,211		$1,211	**$23,611**	$4,722	$0
1	100-B-34 (Radioactive Process sewer)	145 Move water main	1	$78,000	$858,000	$128,700	$85,800	**$1,072,500**	$92,235	**$1,164,735**	$174,710	$116,474	**$1,455,919**		$72,796		$87,355		$87,355	**$1,703,425**	$340,685	$0
1	100-B-34 (Radioactive Process sewer)	252 Sampling Crew	2	$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**		$82		$98		$98	**$1,912**	$382	$0
2	100-B-34 (Dichromate Transfer Line)	252 Sampling Crew	2	$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**		$82		$98		$98	**$1,912**	$382	$0
1	100-B-34 (Radioactive Process sewer)	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**		$15		$18		$18	**$360**	$72	$0
2	100-B-34 (Dichromate Transfer Line)	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**		$15		$18		$18	**$360**	$72	$0
1	100-B-34 (Radioactive Process sewer)	133 Backfill and soil cover crew (#46)	133	$18,053	$198,585	$29,788	$19,859	**$248,232**	$21,348	**$269,580**	$40,437	$26,958	**$336,975**		$16,849		$20,218		$20,218	**$394,260**	$78,852	$0
2	100-B-34 (Dichromate Transfer Line)	133 Backfill and soil cover crew (#46)	203	$27,649	$304,142	$45,621	$30,414	**$380,178**	$32,695	**$412,873**	$61,931	$41,287	**$516,091**		$25,805		$30,965		$30,965	**$603,827**	$120,765	$0
1	100-B-34 (Radioactive Process sewer)	659 ERDF Disposal Soil Cost ($/Sample)	1	$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**		$46		$56		$56	**$1,085**	$217	$0
2	100-B-34 (Dichromate Transfer Line)	659 ERDF Disposal Soil Cost ($/Sample)	1	$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**		$46		$56		$56	**$1,085**	$217	$0
1	100-B-34 (Radioactive Process sewer)	811 ERDF WG	125	$1,034	$11,373	$1,706	$1,137	**$14,216**	$1,223	**$15,439**	$2,316	$1,544	**$19,299**		$965		$1,158		$1,158	**$22,580**	$4,516	$0
2	100-B-34 (Dichromate Transfer Line)	811 ERDF WG	19	$162	$1,778	$267	$178	**$2,222**	$191	**$2,413**	$362	$241	**$3,016**		$151		$181		$181	**$3,529**	$706	$0
3	116-C-1	118 Fuel - Diesel	594	$218	$2,399	$360	$240	**$2,999**	$258	**$3,257**	$489	$326	**$4,072**		$204		$244		$244	**$4,764**	$953	$0
3	116-C-1	119 Fuel Delivery	594	$106	$1,170	$176	$117	**$1,463**	$126	**$1,589**	$238	$159	**$1,986**		$99		$119		$119	**$2,323**	$465	$0
3	116-C-1	111 Excavation Crew (#43) Contaminated	1,647	$201,401	$2,215,416	$332,312	$221,542	**$2,769,270**	$238,157	**$3,007,427**	$451,114	$300,743	**$3,759,284**		$187,964		$225,557		$225,557	**$4,398,363**	$879,673	$0
3	116-C-1	110 Excavation Crew (#42) Un-contaminated	1,920	$173,534	$1,908,874	$286,331	$190,887	**$2,386,093**	$205,204	**$2,591,297**	$388,694	$259,130	**$3,239,121**		$161,956		$194,347		$194,347	**$3,789,771**	$757,954	$0
3	116-C-1	114 Excavator (Contaminated)	10	$5,351	$58,863	$8,829	$5,886	**$73,579**	$6,328	**$79,906**	$11,986	$7,991	**$99,883**		$4,994		$5,993		$5,993	**$116,863**	$23,373	$0
3	116-C-1	113 Excavator (Un-contaminated)	12	$6,239	$68,629	$10,294	$6,863	**$85,787**	$7,378	**$93,164**	$13,975	$9,316	**$116,455**		$5,823		$6,987		$6,987	**$136,253**	$27,251	$0
3	116-C-1	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	18	$294	$3,230	$484	$323	**$4,037**	$347	**$4,384**	$658	$438	**$5,480**		$274		$329		$329	**$6,412**	$1,282	$0
3	116-C-1	659 ERDF Disposal Soil Cost ($/Sample)	99	$4,910	$54,009	$8,101	$5,401	**$67,511**	$5,806	**$73,317**	$10,998	$7,332	**$91,646**		$4,582		$5,499		$5,499	**$107,226**	$21,445	$0
3	116-C-1	811 ERDF WG	9,879	$1,065,953	$11,725,487	$1,758,823	$1,172,549	**$14,656,859**	$1,260,490	**$15,917,349**	$2,387,602	$1,591,735	**$19,896,686**		$994,834		$1,193,801		$1,193,801	**$23,279,123**	$4,655,825	$0
3	116-C-1	133 Backfill and soil cover crew (#46)	2,194	$298,287	$3,281,159	$492,174	$328,116	**$4,101,448**	$352,725	**$4,454,173**	$668,126	$445,417	**$5,567,716**		$278,386		$334,063		$334,063	**$6,514,228**	$1,302,846	$0
3	116-C-1	05 OPERATOR GROUP VIII	2194	$15,350	$168,848	$25,327	$16,885	**$211,060**	$18,151	**$229,212**	$34,382	$22,921	**$286,514**		$14,326		$17,191		$17,191	**$335,222**	$67,044	$0
3	116-C-1	112 DumpTrucks	5	$8,503	$93,532	$14,030	$9,353	**$116,914**	$10,055	**$126,969**	$19,045	$12,697	**$158,711**		$7,936		$9,523		$9,523	**$185,692**	$37,138	$0
3	116-C-1	134 Front End Loader		$55,805	$613,854	$92,078	$61,385	**$767,317**	$65,989	**$833,307**	$124,996	$83,331	**$1,041,633**		$52,082		$62,498		$62,498	**$1,218,711**	$243,742	$0
3	116-C-1	137 Water Truck		$22,322	$245,542	$36,831	$24,554	**$306,927**	$26,396	**$333,323**	$49,998	$33,332	**$416,653**		$20,833		$24,999		$24,999	**$487,484**	$97,497	$0

3	116-C-1	Backfill	139 Revegetate area	7	Ac	$5,010	$35,920	0	0	1	revegetate area		$3,592	$39,512	$5,927	$3,951	**$49,390**	$4,248	**$53,638**	$8,046	$5,364	**$67,048**	$3,352	$4,023	$4,023	**$78,446**	$15,689	$0
3	116-C-1	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$120,000	0	0	1	survey tent $120000 (allowance)		$12,000	$132,000	$19,800	$13,200	**$165,000**	$14,190	**$179,190**	$26,879	$17,919	**$223,988**	$11,199	$13,439	$13,439	**$262,065**	$52,413	$0
3	116-C-1	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	1,976	Crew Hr	$232	$457,994	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$45,799	$503,794	$75,569	$50,379	**$629,742**	$0	**$629,742**	$94,461	$62,974	**$787,178**	$39,359	$47,231	$47,231	**$920,998**	$184,200	$0
3	116-C-1	Backfill	05 OPERATOR GROUP VIII	11,521	HR	$70	$805,937	0	0	1	operators for water truck and front end loader		$80,594	$886,530	$132,980	$88,653	**$1,108,163**	$95,302	**$1,203,465**	$180,520	$120,347	**$1,504,331**	$75,217	$90,260	$90,260	**$1,760,068**	$352,014	$0
-		**Excavation - site 118-B-1**																											
4	118-B-1 (burial grd)	Excavation	111 Excavation Crew (#43) Contaminated	2,015	Crew Hr	$1,223	$2,464,245	0	0	1	excavation during contaminated areas based on cy/60hrs		$246,425	$2,710,670	$406,600	$271,067	**$3,388,337**	$291,397	**$3,679,734**	$551,960	$367,973	**$4,599,668**	$229,983	$275,980	$275,980	**$5,381,611**	$1,076,322	$0
4	118-B-1 (burial grd)	Excavation	110 Excavation Crew (#42) Un-contaminated	1,717	Crew Hr	$904	$1,551,832	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$155,183	$1,707,015	$256,052	$170,702	**$2,133,769**	$183,504	**$2,317,273**	$347,591	$231,727	**$2,896,592**	$144,830	$173,796	$173,796	**$3,389,012**	$677,802	$0
4	118-B-1 (burial grd)	Excavation	114 Excavator (Contaminated)	13	MO	$5,200	$65,474	0	0	1	excavator time based on crew time for excavating contaminated soil		$6,547	$72,022	$10,803	$7,202	**$90,027**	$7,742	**$97,769**	$14,665	$9,777	**$122,212**	$6,111	$7,333	$7,333	**$142,988**	$28,598	$0
4	118-B-1 (burial grd)	Excavation	113 Excavator (Un-contaminated)	11	MO	$5,200	$55,793	0	0	1	excavator time based on crew time for excavating non contaminated soil		$5,579	$61,372	$9,206	$6,137	**$76,715**	$6,597	**$83,312**	$12,497	$8,331	**$104,141**	$5,207	$6,248	$6,248	**$121,844**	$24,369	$0
4	118-B-1 (burial grd)	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	8	EA	$165	$1,396	0	0	1	analytical during excavaion to verify clean based on SF/6724		$140	$1,535	$230	$154	**$1,919**	$165	**$2,084**	$313	$208	**$2,605**	$130	$156	$156	**$3,048**	$610	$0
-		**ERDF Disposal & Backfill - site 118-B-1**																											
4	118-B-1 (burial grd)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	107	EA	$497	$53,015	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification		$5,302	$58,317	$8,748	$5,832	**$72,896**	$6,269	**$79,165**	$11,875	$7,917	**$98,957**	$4,948	$5,937	$5,937	**$115,779**	$23,156	$0
4	118-B-1 (burial grd)	ERDF Disposal	811 ERDF WG	120,875	Ton	$83	$10,032,661	0	0	1	CY of contaminated soild going to ERDF	10,667	$1,003,266	$11,035,928	$1,655,389	$1,103,593	**$13,794,909**	$1,186,362	**$14,981,272**	$2,247,191	$1,498,127	**$18,726,590**	$936,329	$1,123,595	$1,123,595	**$21,910,110**	$4,382,022	$0
4	118-B-1 (burial grd)	Backfill	133 Backfill and soil cover crew (#46)	2,266	Crew Hr	$1,359	$3,080,254	0	0	1	backfill crew based on cy/185		$308,025	$3,388,280	$508,242	$338,828	**$4,235,349**	$364,240	**$4,599,590**	$689,938	$459,959	**$5,749,487**	$287,474	$344,969	$344,969	**$6,726,900**	$1,345,380	$0
4	118-B-1 (burial grd)	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
4	118-B-1 (burial grd)	Backfill	112 DumpTrucks	14	MO	$6,200	$87,805	0	0	1	Trucks from borrow pit		$8,780	$96,585	$14,488	$9,659	**$120,731**	$10,383	**$131,114**	$19,667	$13,111	**$163,893**	$8,195	$9,834	$9,834	**$191,755**	$38,351	$0
4	118-B-1 (burial grd)	Backfill	134 Front End Loader	37	MO	$15,500	$580,980	0	0	1	front end loader to deliver and sprad backfill soil		$58,098	$639,078	$95,862	$63,908	**$798,848**	$68,701	**$867,549**	$130,132	$86,755	**$1,084,436**	$54,222	$65,066	$65,066	**$1,268,790**	$253,758	$0
4	118-B-1 (burial grd)	Backfill	137 Water Truck	37	MO	$6,200	$232,392	0	0	1	water truck		$23,239	$255,631	$38,345	$25,563	**$319,539**	$27,480	**$347,019**	$52,053	$34,702	**$433,774**	$21,689	$26,026	$26,026	**$507,516**	$101,503	$0
4	118-B-1 (burial grd)	Backfill	139 Revegetate area	6	Ac	$5,010	$31,876	0	0	1	revegetate area		$3,188	$35,063	$5,260	$3,506	**$43,829**	$3,769	**$47,599**	$7,140	$4,760	**$59,498**	$2,975	$3,570	$3,570	**$69,613**	$13,923	$0
4	118-B-1 (burial grd)	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$120,000	0	0	1	survey tent $120000 (allowance)		$12,000	$132,000	$19,800	$13,200	**$165,000**	$14,190	**$179,190**	$26,879	$17,919	**$223,988**	$11,199	$13,439	$13,439	**$262,065**	$52,413	$0
4	118-B-1 (burial grd)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	2,133	Crew Hr	$232	$494,526	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$49,453	$543,979	$81,597	$54,398	**$679,973**	$0	**$679,973**	$101,996	$67,997	**$849,967**	$42,498	$50,998	$50,998	**$994,461**	$198,892	$0
4	118-B-1 (burial grd)	Backfill	05 OPERATOR GROUP VIII	2266	HR	$70	$158,510	0	0	1	truck drivers		$15,851	$174,361	$26,154	$17,436	**$217,951**	$18,744	**$236,695**	$35,504	$23,669	**$295,868**	$14,793	$17,752	$17,752	**$346,166**	$69,233	$0
4	118-B-1 (burial grd)	Backfill	05 OPERATOR GROUP VIII	11994	HR	$70	$839,054	0	0	1	operators for water truck and front end loader		$83,905	$922,960	$138,444	$92,296	**$1,153,700**	$99,218	**$1,252,918**	$187,938	$125,292	**$1,566,147**	$78,307	$93,969	$93,969	**$1,832,392**	$366,478	$0
4	118-B-1 (burial grd)	Excavation	118 Fuel - Diesel	622	gal	$4	$2,282	0	0	1	fuel delivery		$228	$2,511	$377	$251	**$3,138**	$270	**$3,408**	$511	$341	**$4,260**	$213	$256	$256	**$4,984**	$997	$0
4	118-B-1 (burial grd)	Excavation	119 Fuel Delivery	622	gal	$2	$1,113	0	0	1	fuel		$111	$1,224	$184	$122	**$1,531**	$132	**$1,662**	$249	$166	**$2,078**	$104	$125	$125	**$2,431**	$486	$0
-		**Excavation - site 118-B-8:4**																											
5	118-B-8:4	Excavation	111 Excavation Crew (#43) Contaminated	15	Crew Hr	$1,223	$18,287	0	0	1	excavation during contaminated areas based on cy/60hrs		$1,829	$20,115	$3,017	$2,012	**$25,144**	$2,162	**$27,307**	$4,096	$2,731	**$34,133**	$1,707	$2,048	$2,048	**$39,936**	$7,987	$0
5	118-B-8:4	Excavation	110 Excavation Crew (#42) Un-contaminated	128	Crew Hr	$904	$115,639	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$11,564	$127,203	$19,080	$12,720	**$159,004**	$13,674	**$172,678**	$25,902	$17,268	**$215,848**	$10,792	$12,951	$12,951	**$252,542**	$50,508	$0
5	118-B-8:4	Excavation	114 Excavator (Contaminated)	1	MO	$5,200	$5,200	0	0	1	excavator time based on crew time for excavating contaminated soil		$520	$5,720	$858	$572	**$7,150**	$615	**$7,765**	$1,165	$776	**$9,706**	$485	$582	$582	**$11,356**	$2,271	$0
5	118-B-8:4	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$4,158	0	0	1	excavator time based on crew time for excavating non contaminated soil		$416	$4,573	$686	$457	**$5,717**	$492	**$6,208**	$931	$621	**$7,760**	$388	$466	$466	**$9,080**	$1,816	$0
5	118-B-8:4	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analytical during excavaion to verify clean based on SF/6724		$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**ERDF Disposal & Backfill - site 118-B-8:4**																											
5	118-B-8:4	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	90	$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
5	118-B-8:4	ERDF Disposal	811 ERDF WG	1166	Ton	$83	$96,785	0	0	1	CY of contaminated soild going to ERDF		$9,679	$106,464	$15,970	$10,646	**$133,080**	$11,445	**$144,525**	$21,679	$14,452	**$180,656**	$9,033	$10,839	$10,839	**$211,368**	$42,274	$0
5	118-B-8:4	Backfill	133 Backfill and soil cover crew (#46)	115	Crew Hr	$1,359	$156,990	0	0	1	backfill crew based on cy/185		$15,699	$172,689	$25,903	$17,269	**$215,861**	$18,564	**$234,425**	$35,164	$23,442	**$293,031**	$14,652	$17,582	$17,582	**$342,847**	$68,569	$0
5	118-B-8:4	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	112 DumpTrucks	2	MO	$6,200	$10,011	0	0	1	Trucks from borrow pit		$1,001	$11,013	$1,652	$1,101	**$13,766**	$1,184	**$14,950**	$2,242	$1,495	**$18,687**	$934	$1,121	$1,121	**$21,864**	$4,373	$0
5	118-B-8:4	Backfill	134 Front End Loader	2	MO	$15,500	$25,029	0	0	1	front end loader to deliver and sprad backfill soil		$2,503	$27,532	$4,130	$2,753	**$34,414**	$2,960	**$37,374**	$5,606	$3,737	**$46,718**	$2,336	$2,803	$2,803	**$54,660**	$10,932	$0
5	118-B-8:4	Backfill	137 Water Truck	2	MO	$6,200	$10,011	0	0	1	water truck		$1,001	$11,013	$1,652	$1,101	**$13,766**	$1,184	**$14,950**	$2,242	$1,495	**$18,687**	$934	$1,121	$1,121	**$21,864**	$4,373	$0
5	118-B-8:4	Backfill	139 Revegetate area	0	Ac	$5,010	$2,412	0	0	1	revegetate area		$241	$2,653	$398	$265	**$3,317**	$285	**$3,602**	$540	$360	**$4,502**	$225	$270	$270	**$5,268**	$1,054	$0
5	118-B-8:4						$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	18	Crew Hr	$232	$4,158	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$416	$4,574	$686	$457	**$5,718**	$0	**$5,718**	$858	$572	**$7,147**	$357	$429	$429	**$8,362**	$1,672	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	115	HR	$70	$8,079	0	0	1	truck drivers		$808	$8,887	$1,333	$889	**$11,108**	$955	**$12,064**	$1,810	$1,206	**$15,079**	$754	$905	$905	**$17,643**	$3,529	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	517	HR	$70	$36,147	0	0	1	operators for water truck and front end loader		$3,615	$39,761	$5,964	$3,976	**$49,702**	$4,274	**$53,976**	$8,096	$5,398	**$67,470**	$3,373	$4,048	$4,048	**$78,940**	$15,788	$0
5	118-B-8:4	Excavation	118 Fuel - Diesel	24	gal	$4	$87	0	0	1	fuel delivery		$9	$96	$14	$10	**$120**	$10	**$130**	$20	$13	**$163**	$8	$10	$10	**$191**	$38	$0
5	118-B-8:4	Excavation	119 Fuel Delivery	24	gal	$2	$43	0	0	1	fuel		$4	$47	$7	$5	**$59**	$5	**$64**	$10	$6	**$80**	$4	$5	$5	**$93**	$19	$0
-		**Excavation - site 116-B-6A**																											
7	116-B-6A/116-B-16 Tank	Excavation	111 Excavation Crew (#43) Contaminated	40	Crew Hr	$1,223	$49,254	0	0	1	excavation during contaminated areas based on cy/60hrs		$4,925	$54,180	$8,127	$5,418	**$67,724**	$5,824	**$73,549**	$11,032	$7,355	**$91,936**	$4,597	$5,516	$5,516	**$107,565**	$21,513	$0
7	116-B-6A/116-B-16 Tank	Excavation	110 Excavation Crew (#42) Un-contaminated	218	Crew Hr	$904	$196,816	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$19,682	$216,498	$32,475	$21,650	**$270,622**	$23,274	**$293,896**	$44,084	$29,390	**$367,370**	$18,368	$22,042	$22,042	**$429,822**	$85,964	$0
7	116-B-6A/116-B-16 Tank	Excavation	114 Excavator (Contaminated)	1	MO	$5,200	$5,200	0	0	1	excavator time based on crew time for excavating contaminated soil		$520	$5,720	$858	$572	**$7,150**	$615	**$7,765**	$1,165	$776	**$9,706**	$485	$582	$582	**$11,356**	$2,271	$0
7	116-B-6A/116-B-16 Tank	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$7,076	0	0	1	excavator time based on crew time for excavating non contaminated soil		$708	$7,784	$1,168	$778	**$9,730**	$837	**$10,566**	$1,585	$1,057	**$13,208**	$660	$792	$792	**$15,453**	$3,091	$0
7	116-B-6A/116-B-16 Tank	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analytical during excavaion to verify clean based on SF/6724		$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**ERDF Disposal & Backfill - site 116-B-6A**																											
7	116-B-6A/116-B-16 Tank	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	2	EA	$497	$897	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	181	$90	$987	$148	$99	**$1,234**	$106	**$1,340**	$201	$134	**$1,675**	$84	$100	$100	**$1,959**	$392	$0

7	116-B-6A/116-B-16 Tank	ERDF Disposal	811 ERDF WG	2347	Ton	$83	$194,785	0	0	1	CY of contaminated soild going to ERDF	$19,479	$214,264	$32,140	$21,426	**$267,830**	$23,033	**$290,863**	$43,629	$29,086	**$363,579**	$18,179	$21,815	$21,815	**$425,387**	$85,077	$0
7	116-B-6A/116-B-16 Tank	Backfill	133 Backfill and soil cover crew (#46)	257	Crew Hr	$1,359	$350,013	0	0	1	backfill crew based on cy/185	$35,001	$385,014	$57,752	$38,501	**$481,268**	$41,389	**$522,657**	$78,399	$52,266	**$653,321**	$32,666	$39,199	$39,199	**$764,386**	$152,877	$0
7	116-B-6A/116-B-16 Tank						$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
7	116-B-6A/116-B-16 Tank	Backfill	112 DumpTrucks	3	MO	$6,200	$19,975	0	0	1	Trucks from borrow pit	$1,997	$21,972	$3,296	$2,197	**$27,465**	$2,362	**$29,827**	$4,474	$2,983	**$37,284**	$1,864	$2,237	$2,237	**$43,622**	$8,724	$0
7	116-B-6A/116-B-16 Tank	Backfill	134 Front End Loader	3	MO	$15,500	$49,936	0	0	1	front end loader to deliver and sprad backfill soil	$4,994	$54,930	$8,240	$5,493	**$68,663**	$5,905	**$74,568**	$11,185	$7,457	**$93,209**	$4,660	$5,593	$5,593	**$109,055**	$21,811	$0
7	116-B-6A/116-B-16 Tank	Backfill	137 Water Truck	3	MO	$6,200	$19,975	0	0	1	water truck	$1,997	$21,972	$3,296	$2,197	**$27,465**	$2,362	**$29,827**	$4,474	$2,983	**$37,284**	$1,864	$2,237	$2,237	**$43,622**	$8,724	$0
7	116-B-6A/116-B-16 Tank	Backfill	139 Revegetate area	1	Ac	$5,010	$6,742	0	0	1	revegetate area	$674	$7,416	$1,112	$742	**$9,270**	$797	**$10,068**	$1,510	$1,007	**$12,585**	$629	$755	$755	**$14,724**	$2,945	$0
7	116-B-6A/116-B-16 Tank						$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
7	116-B-6A/116-B-16 Tank	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	36	Crew Hr	$232	$8,369	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.	$837	$9,206	$1,381	$921	**$11,507**	$0	**$11,507**	$1,726	$1,151	**$14,384**	$719	$863	$863	**$16,830**	$3,366	$0
7	116-B-6A/116-B-16 Tank	Backfill	05 OPERATOR GROUP VIII	257	HR	$70	$18,012	0	0	1	truck drivers	$1,801	$19,813	$2,972	$1,981	**$24,766**	$2,130	**$26,896**	$4,034	$2,690	**$33,620**	$1,681	$2,017	$2,017	**$39,335**	$7,867	$0
7	116-B-6A/116-B-16 Tank	Backfill	05 OPERATOR GROUP VIII	1031	HR	$70	$72,118	0	0	1	operators for water truck and front end loader	$7,212	$79,330	$11,900	$7,933	**$99,163**	$8,528	**$107,691**	$16,154	$10,769	**$134,613**	$6,731	$8,077	$8,077	**$157,498**	$31,500	$0
7	116-B-6A/116-B-16 Tank	Excavation	118 Fuel - Diesel	43	gal	$4	$158	0	0	1	fuel delivery	$16	$174	$26	$17	**$217**	$19	**$236**	$35	$24	**$295**	$15	$18	$18	**$345**	$69	$0
7	116-B-6A/116-B-16 Tank	Excavation	119 Fuel Delivery	43	gal	$2	$77	0	0	1	fuel	$8	$85	$13	$8	**$106**	$9	**$115**	$17	$11	**$144**	$7	$9	$9	**$168**	$34	$0
-		**Install 6 New Monitoring Wells**																									
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	600	LF	$546	$327,600	0	0	1	Phase I: 6 new wells = (new monitoring wells)	$32,760	$360,360	$54,054	$36,036	**$450,450**	$38,739	**$489,189**	$73,378	$48,919	**$611,486**	$30,574	$36,689	$36,689	**$715,438**	$143,088	$0
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	400	LF	$546	$218,400	6	6	1	Phase II: 4 new wells (new monitoring wells) - after 5 years	$21,840	$240,240	$36,036	$24,024	**$300,300**	$25,826	**$326,126**	$48,919	$32,613	**$407,657**	$20,383	$24,459	$24,459	**$476,959**	$95,392	$0
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	60	HR	$103	$6,185	0	0	1	assume 10 ft per hour based on number of linear feet	$619	$6,804	$1,021	$680	**$8,505**	$731	**$9,236**	$1,385	$924	**$11,545**	$577	$693	$693	**$13,508**	$2,702	$0
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	40	HR	$103	$4,124	6	6	1	assume 10 ft per hour based on number of linear feet	$412	$4,536	$680	$454	**$5,670**	$488	**$6,158**	$924	$616	**$7,697**	$385	$462	$462	**$9,005**	$1,801	$0
8	Groundwater	well drilling	295 Dispose of drill cuttings	44	ton	$83	$3,625	0	0	1	6 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy	$363	$3,988	$598	$399	**$4,985**	$429	**$5,414**	$812	$541	**$6,767**	$338	$406	$406	**$7,918**	$1,584	$0
8	Groundwater	well drilling	295 Dispose of drill cuttings	29	ton	$83	$2,417	6	6	1	4 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy	$242	$2,659	$399	$266	**$3,323**	$286	**$3,609**	$541	$361	**$4,511**	$226	$271	$271	**$5,278**	$1,056	$0
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well	$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**	$1,260	$1,512	$1,512	**$29,482**	$5,896	$0
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	6000	LF	$2	$9,000	6	6	1	4 wells, assumed 1,500 LF of power cable for each well	$900	$9,900	$1,485	$990	**$12,375**	$1,064	**$13,439**	$2,016	$1,344	**$16,799**	$840	$1,008	$1,008	**$19,655**	$3,931	$0
-		**Expansion of 100-KW P&T System**																									
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	1	LS	$1,593,940	$1,593,940	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from 300 to 400 GPM)	$159,394	$1,753,334	$263,000	$175,333	**$2,191,668**	$0	**$2,191,668**	$328,750	$219,167	**$2,739,584**	$136,979	$164,375	$164,375	**$3,205,314**	$641,063	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	1	LS	$2,343,434	$2,343,434	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from 300 to 400 GPM)	$234,343	$2,577,777	$386,667	$257,778	**$3,222,222**	$277,111	**$3,499,333**	$524,900	$349,933	**$4,374,166**	$218,708	$262,450	$262,450	**$5,117,774**	$1,023,555	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$3	$0	0	0	1	3" HDPE Transfer Piping, ft (extraction)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$11	$0	0	0	1	8" HDPE Transfer Piping, ft (extraction)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	1050 Pipe Fusion Crew (includes testing)	0	team hr	$907	$0	0	0	1	pipe fusion crew to connect pipe lengths, test and place in trench (extraction)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	30 McElroy Fusion Machine	0	WK	$225	$0	0	0	1	Weekly rental of fusion machine for fusing pipelines. Using the pipeline fusion crew for time for use of fusion machine (extraction)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (extraction)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	100 Project Management Crew	0	Crew Hr	$386	$0	0	0	1	Project management at half time during excavation & pipe fusion (extraction)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	17 Freight for HDPE Pipe	0	trip	$2,500	$0	0	0	1	frieght for pipe for extraction wells, 20 foot length with 54 pipes per load	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
-		**Extraction wells & equipment**																									
8	Groundwater	Extraction Wells	253 Extraction well(s)	800	LF	$535	$428,000	0	0	1	4 shallow (100') + 2 deep (200') (total of 6) - 8" diameter extraction wells	$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**	$39,944	$47,933	$47,933	**$934,700**	$186,940	$0
8	Groundwater	Extraction Wells	275 Pump Assembly	6	EA	$3,200	$19,200	0	0	1	6 pumps for 6 extraction wells	$1,920	$21,120	$3,168	$2,112	**$26,400**	$2,270	**$28,670**	$4,301	$2,867	**$35,838**	$1,792	$2,150	$2,150	**$41,930**	$8,386	$0
8	Groundwater	Extraction Wells	289 Landing Plate	6	EA	$350	$2,100	0	0	1	6 landing plates for 6 extraction wells	$210	$2,310	$347	$231	**$2,888**	$248	**$3,136**	$470	$314	**$3,920**	$196	$235	$235	**$4,586**	$917	$0
8	Groundwater	Extraction Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	riser pipe for each well	$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**	$3,699	$4,439	$4,439	**$86,551**	$17,310	$0
8	Groundwater	Extraction Wells	279 Disconnect Boxes	6	EA	$400	$2,400	0	0	1	6 disconnect boxes for 6 extraction wells	$240	$2,640	$396	$264	**$3,300**	$284	**$3,584**	$538	$358	**$4,480**	$224	$269	$269	**$5,241**	$1,048	$0
8	Groundwater	Extraction Wells	280 Allowance for Electrical Hookups	1	EA	$228	$228	0	0	1	1 allowance for electrical hookups for the 6 extraction wells	$23	$251	$38	$25	**$314**	$27	**$340**	$51	$34	**$426**	$21	$26	$26	**$498**	$100	$0
8	Groundwater	Extraction Wells	266 #10/4C THHN (tray cable)	800	LF	$2	$1,216	0	0	1	200 LF x 6 wells	$122	$1,338	$201	$134	**$1,672**	$144	**$1,816**	$272	$182	**$2,270**	$113	$136	$136	**$2,656**	$531	$0
8	Groundwater	Extraction Wells	285 Pump Setting Crew	60	Team/Hr	$529	$31,718	0	0	1	1 - 10 hour days per well x 6 wells	$3,172	$34,890	$5,233	$3,489	**$43,612**	$3,751	**$47,363**	$7,104	$4,736	**$59,204**	$2,960	$3,552	$3,552	**$69,268**	$13,854	$0
8	Groundwater	Extraction Wells	284 Extraction rack	6	EA	$150,000	$900,000	0	0	1	1 extraction well rack per well x 6 wells	$90,000	$990,000	$148,500	$99,000	**$1,237,500**	$106,425	**$1,343,925**	$201,589	$134,393	**$1,679,906**	$83,995	$100,794	$100,794	**$1,965,490**	$393,098	$0
8	Groundwater	Extraction Wells	10 Drilling Mobilization, completion, cleanup and demob	6	per well	$36,250	$217,500	0	0	1	drilling mob/demob etc per well x 6 wells	$21,750	$239,250	$35,888	$23,925	**$299,063**	$25,719	**$324,782**	$48,717	$32,478	**$405,977**	$20,299	$24,359	$24,359	**$474,993**	$94,999	$0
8	Groundwater	Extraction Wells	268 Water Level Sensor	6	EA	$1,200	$7,200	0	0	1	6 wells x 1 water level sensor	$720	$7,920	$1,188	$792	**$9,900**	$851	**$10,751**	$1,613	$1,075	**$13,439**	$672	$806	$806	**$15,724**	$3,145	$0
8	Groundwater	Extraction Wells	291 10000 Gallon Norwesco Plastic Potable Water Storage Tank	1	EA	$5,870	$5,870	0	0	1	1 - Influent collection tank, 10,000 gallons	$587	$6,457	$969	$646	**$8,071**	$694	**$8,765**	$1,315	$877	**$10,957**	$548	$657	$657	**$12,819**	$2,564	$0
8	Groundwater	Extraction Wells	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	5000	LF	$3	$16,400	0	0	1	3" HDPE Transfer Piping, ft	$1,640	$18,040	$2,706	$1,804	**$22,550**	$1,939	**$24,489**	$3,673	$2,449	**$30,612**	$1,531	$1,837	$1,837	**$35,816**	$7,163	$0
8	Groundwater	Extraction Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPE Transfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Extraction Wells	1050 Pipe Fusion Crew (includes testing)	250	team hr	$907	$226,814	0	0	1	cost for fusion crew working on injection wells	$22,681	$249,496	$37,424	$24,950	**$311,870**	$26,821	**$338,690**	$50,804	$33,869	**$423,363**	$21,168	$25,402	$25,402	**$495,335**	$99,067	$0
8	Groundwater	Extraction Wells	30 McElroy Fusion Machine	6	WK	$225	$1,406	0	0	1	Pipe fusion machine	$141	$1,547	$232	$155	**$1,934**	$166	**$2,100**	$315	$210	**$2,625**	$131	$157	$157	**$3,071**	$614	$0

8	Groundwater	Extraction Wells	110 Excavation Crew (#42) Un-contaminated	250	Crew Hr	$904	$225,991	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$22,599	$248,590	$37,288	$24,859	**$310,737**	$26,723	**$337,461**	$50,619	$33,746	**$421,826**	$21,091	$25,310	$25,310	**$493,536**	$98,707	$0
8	Groundwater	Extraction Wells	100 Project Management Crew	125	Crew Hr	$386	$48,295	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,829	$53,124	$7,969	$5,312	**$66,405**	$5,711	**$72,116**	$10,817	$7,212	**$90,145**	$4,507	$5,409	$5,409	**$105,469**	$21,094	$0
8	Groundwater	Extraction Wells	17 Freight for HDPE Pipe	14	trip	$2,500	$34,722	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,472	$38,194	$5,729	$3,819	**$47,743**	$4,106	**$51,849**	$7,777	$5,185	**$64,811**	$3,241	$3,889	$3,889	**$75,829**	$15,166	$0
8	Groundwater	Extraction Wells	260 Fiber-optic cable and interfaces	10000	FT	$1	$13,300	0	0	1	Fiber Optic Cable	$1,330	$14,630	$2,195	$1,463	**$18,288**	$1,573	**$19,860**	$2,979	$1,986	**$24,825**	$1,241	$1,490	$1,490	**$29,046**	$5,809	$0
8	Groundwater	Extraction Wells	265 Transfer Station (extraction station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Extraction Wells	293 Fiber Optic Splice Box	4	EA	$1,000	$4,000	0	0	1	splice box every 2,500 running feet of fiber cable	$400	$4,400	$660	$440	**$5,500**	$473	**$5,973**	$896	$597	**$7,466**	$373	$448	$448	**$8,736**	$1,747	$0
8	Groundwater	Extraction Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	assume 10 ft per hour based on number of linear feet	$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**	$770	$924	$924	**$18,011**	$3,602	$0
8	Groundwater	Extraction Wells	50 Globe Valve 3"	6	EA	$1,280	$7,679	0	0	1	1 ball valve per well x 6 wells	$768	$8,447	$1,267	$845	**$10,558**	$908	**$11,466**	$1,720	$1,147	**$14,333**	$717	$860	$860	**$16,770**	$3,354	$0
8	Groundwater	Extraction Wells	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well	$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**	$1,260	$1,512	$1,512	**$29,482**	$5,896	$0
8	Groundwater	Extraction Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	4 shallow (100')(5.1611 cy x 4) + 2 deep (200')(10.322cy x 2) (total of 6 wells) - 8" diameter extraction wells. 2,900 lbs/cy	$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**	$464	$557	$557	**$10,852**	$2,170	$0
-		**4 new injection wells & equipment & associated Piping**																									
8	Groundwater	Injection Wells	292 SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size (*3.97" I.D.) x **20 ft., †MAX PSI 100 @ 73 Deg. F (PRICE IS PER FOOT. ONLY SOLD IN 20 FT. LENGTHS)	4000	LF	$3	$13,120	0	0	1	4" HDPE Transfer Piping, ft	$1,312	$14,432	$2,165	$1,443	**$18,040**	$1,551	**$19,591**	$2,939	$1,959	**$24,489**	$1,224	$1,469	$1,469	**$28,652**	$5,730	$0
8	Groundwater	Injection Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPETransfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Injection Wells	1050 Pipe Fusion Crew (includes testing)	240	team hr	$907	$217,742	0	0	1	cost for fusion crew working on injection wells	$21,774	$239,516	$35,927	$23,952	**$299,395**	$25,748	**$325,143**	$48,771	$32,514	**$406,428**	$20,321	$24,386	$24,386	**$475,521**	$95,104	$0
8	Groundwater	Injection Wells	30 McElroy Fusion Machine	6	WK	$225	$1,350	0	0	1	Pipe fusion machine	$135	$1,485	$223	$149	**$1,856**	$160	**$2,016**	$302	$202	**$2,520**	$126	$151	$151	**$2,948**	$590	$0
8	Groundwater	Injection Wells	110 Excavation Crew (#42) Un-contaminated	240	Crew Hr	$904	$216,951	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$21,695	$238,646	$35,797	$23,865	**$298,308**	$25,654	**$323,962**	$48,594	$32,396	**$404,953**	$20,248	$24,297	$24,297	**$473,795**	$94,759	$0
8	Groundwater	Injection Wells	100 Project Management Crew	120	Crew Hr	$386	$46,363	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,636	$50,999	$7,650	$5,100	**$63,749**	$5,482	**$69,231**	$10,385	$6,923	**$86,539**	$4,327	$5,192	$5,192	**$101,251**	$20,250	$0
8	Groundwater	Injection Wells	17 Freight for HDPE Pipe	13	trip	$2,500	$32,407	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,241	$35,648	$5,347	$3,565	**$44,560**	$3,832	**$48,392**	$7,259	$4,839	**$60,490**	$3,025	$3,629	$3,629	**$70,774**	$14,155	$0
8	Groundwater	Injection Wells	254 Injection Well(s)	800	LF	$535	$428,000	0	0	1	4 injection wells drilled down to 200 LF	$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**	$39,944	$47,933	$47,933	**$934,700**	$186,940	$0
8	Groundwater	Injection Wells	264 Transfer Station (injection station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Injection Wells	289 Landing Plate	4	EA	$350	$1,400	0	0	1	4 landing plates, 1 for each injection well	$140	$1,540	$231	$154	**$1,925**	$166	**$2,091**	$314	$209	**$2,613**	$131	$157	$157	**$3,057**	$611	$0
8	Groundwater	Injection Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	200 LF x 4 injection wells	$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**	$3,699	$4,439	$4,439	**$86,551**	$17,310	$0
8	Groundwater	Injection Wells	285 Pump Setting Crew	40	Team/Hr	$529	$21,145	0	0	1	10 hours per well x 4 wells for injection wells (using pump setting crew to cost installation of injection racks)	$2,115	$23,260	$3,489	$2,326	**$29,075**	$2,500	**$31,575**	$4,736	$3,158	**$39,469**	$1,973	$2,368	$2,368	**$46,179**	$9,236	$0
8	Groundwater	Injection Wells	283 Injection Rack	4	EA	$40,000	$160,000	0	0	1	1 injection rack per injection well x 4 wells	$16,000	$176,000	$26,400	$17,600	**$220,000**	$18,920	**$238,920**	$35,838	$23,892	**$298,650**	$14,933	$17,919	$17,919	**$349,421**	$69,884	$0
8	Groundwater	Injection Wells	10 Drilling Mobilization, completion, cleanup and demob	4	per well	$36,250	$145,000	0	0	1	4 wells x mob/demob of crew	$14,500	$159,500	$23,925	$15,950	**$199,375**	$17,146	**$216,521**	$32,478	$21,652	**$270,652**	$13,533	$16,239	$16,239	**$316,662**	$63,332	$0
8	Groundwater	Injection Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	4 injection wells drilled down to 200 LF	$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**	$770	$924	$924	**$18,011**	$3,602	$0
8	Groundwater	Injection Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	200 LF x 4 injection wells. 4 x 10.32202 cy x 2,900 lbs per cy / 2,000 for tons	$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**	$464	$556	$556	**$10,852**	$2,170	$0
-		**Excavation - Site 100-B-34 (Sewer Line) - equipment continued**																									
1	100-B-34 (Radioactive Process sewer)	Backfill	112 DumpTrucks	1	MO	$6,200	$5,989	0	0	1	Trucks from borrow pit	$599	$6,588	$988	$659	**$8,235**	$708	**$8,943**	$1,341	$894	**$11,179**	$559	$671	$671	**$13,079**	$2,616	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	134 Front End Loader	1	MO	$15,500	$14,972	0	0	1	front end loader to deliver and spread backfill soil	$1,497	$16,470	$2,470	$1,647	**$20,587**	$1,770	**$22,358**	$3,354	$2,236	**$27,947**	$1,397	$1,677	$1,677	**$32,698**	$6,540	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	137 Water Truck	1	MO	$6,200	$5,989	0	0	1	water truck (entire length of project)	$599	$6,588	$988	$659	**$8,235**	$708	**$8,943**	$1,341	$894	**$11,179**	$559	$671	$671	**$13,079**	$2,616	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	139 Revegetate area	1	Ac	$5,010	$3,571	0	0	1	revegetate area	$357	$3,928	$589	$393	**$4,910**	$422	**$5,332**	$800	$533	**$6,665**	$333	$400	$400	**$7,798**	$1,560	$0
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$78,000	0	0	1	survey tent $120000 (allowance)	$7,800	$85,800	$12,870	$8,580	**$107,250**	$9,224	**$116,474**	$17,471	$11,647	**$145,592**	$7,280	$8,736	$8,736	**$170,342**	$34,068	$0
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	2	Crew Hr	$232	$444	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.	$44	$489	$73	$49	**$611**	$0	**$611**	$92	$61	**$764**	$38	$46	$46	**$893**	$179	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	120 Fuel Charge	132.80	Hr	$16	$2,178	0	0	1	fuel during backfill based on cubic feet of backfill	$218	$2,396	$359	$240	**$2,995**	$258	**$3,252**	$488	$325	**$4,065**	$203	$244	$244	**$4,756**	$951	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	05 OPERATOR GROUP VIII	92	HR	$70	$6,420	0	0	1	Operator for excavators for dichromate pipeline	$642	$7,062	$1,059	$706	**$8,828**	$759	**$9,587**	$1,438	$959	**$11,984**	$599	$719	$719	**$14,021**	$2,804	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	145 Move water main	0	LS	$1,200,000	$420,000	0	0	1	Assumes dichromate line of 55 ft is 35% of move water main cost	$42,000	$462,000	$69,300	$46,200	**$577,500**	$49,665	**$627,165**	$94,075	$62,717	**$783,956**	$39,198	$47,037	$47,037	**$917,229**	$183,446	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	112 DumpTrucks	1	MO	$6,200	$3,556	0	0	1	Trucks from borrow pit	$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	134 Front End Loader	1	MO	$15,500	$8,891	0	0	1	front end loader to deliver and spread backfill soil	$889	$9,780	$1,467	$978	**$12,225**	$1,051	**$13,276**	$1,991	$1,328	**$16,596**	$830	$996	$996	**$19,417**	$3,883	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	137 Water Truck	1	MO	$6,200	$3,556	0	0	1		$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	139 Revegetate area	0	Ac	$5,010	$1,953	0	0	1		$195	$2,148	$322	$215	**$2,685**	$231	**$2,916**	$437	$292	**$3,645**	$182	$219	$219	**$4,264**	$853	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	819 Survey Tent	0	LS	$120,000	$42,000	0	0	1		$4,200	$46,200	$6,930	$4,620	**$57,750**	$4,967	**$62,717**	$9,407	$6,272	**$78,396**	$3,920	$4,704	$4,704	**$91,723**	$18,345	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$69	0	0	1		$7	$76	$11	$8	**$95**	$0	**$95**	$14	$10	**$119**	$6	$7	$7	**$140**	$28	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	120 Fuel Charge	203.40	Hr	$16	$3,336	0	0	1		$334	$3,669	$550	$367	**$4,587**	$394	**$4,981**	$747	$498	**$6,226**	$311	$374	$374	**$7,285**	$1,457	$0

2	100-B-34 (Dichromate Transfer Line)	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
-		**Expansion of 100-KW P&T System**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	0.25	LS	$1,593,940	$398,485	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$39,849	$438,334	$65,750	$43,833	**$547,917**	$0	**$547,917**	$82,188	$54,792	**$684,896**	$34,245	$41,094	$41,094	**$801,328**	$160,266	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	0.25	LS	$2,343,434	$585,859	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$58,586	$644,444	$96,667	$64,444	**$805,555**	$69,278	**$874,833**	$131,225	$87,483	**$1,093,542**	$54,677	$65,612	$65,612	**$1,279,444**	$255,889	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	296 pH Adjustment	1	EA	$610,000	$610,000	0	0	1	Cost for adding pH adjustment capability to 100-KW P&T	$61,000	$671,000	$100,650	$67,100	**$838,750**	$72,133	**$910,883**	$136,632	$91,088	**$1,138,603**	$56,930	$68,316	$68,316	**$1,332,166**	$266,433	$0
-																						**$0.00**					

$263,973.75

ANNUAL O&M COST / ANNUAL O&M MARKUPS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES	MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Technical Support Services Percent	Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
-		**116-B-5 Institutional Controls & closeout**																								
6	116-B-5 (crib)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	5	1	Site visits, 1 per year until 2021, assume MNA monitoring is associated with these site visits (5 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
6	116-B-5 (crib)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	5	5	1	2021 - site closeout	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**MNA & ICs for Groundwater**																								
8	Groundwater	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	75	1	Institutional controls for 75 years starting in 2016	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
-		**P&T for 40 years**																								
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	356 100 KX Pump & Treat Operating Cost	1	per year	$129,524	$129,524	0	40	1	Assumes Cr(VI) < 10 ug/L after 40 Years of Pump and Treat. Assumes 5 years of post-P&T monitoring for Cr(VI).	$0	$129,524	$19,429	$12,952	**$161,905**	$13,924	**$175,829**	$26,374	$17,583	**$219,786**	33%	$72,529	**$292,315**	$58,463	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	355 100KX resin cost	207,360,000	per gal	$0.0008	$165,888	0	40	1	resin cost per year, see backup cost tab for more info, "BKUP" (207,360,000 gallons per year is number of gallons at 400gpm)	$0	$165,888	$24,883	$16,589	**$207,360**	$17,833	**$225,193**	$33,779	$22,519	**$281,491**	33%	$92,892	**$374,383**	$74,877	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	400	gpm	$2,187	$874,800	1	40	1	Annual maintenance of P&T system	$0	$874,800	$131,220	$87,480	**$1,093,500**	$94,041	**$1,187,541**	$178,131	$118,754	**$1,484,426**	26%	$385,951	**$1,870,377**	$374,075	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	40	gpm	$2,187	$87,480	1	40	1	Annual cost for pH adjustment	$0	$87,480	$13,122	$8,748	**$109,350**	$9,404	**$118,754**	$17,813	$11,875	**$148,443**	33%	$48,986	**$197,429**	$39,486	$0
-		**MNA - sampling first year (existing wells)**																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	32	EA	$165	$5,280	1	1	1	annual sampling at 32 existing wells	$0	$5,280	$792	$528	**$6,600**	$568	**$7,168**	$1,075	$717	**$8,960**	45%	$4,032	**$12,991**	$2,598	$0
8	Groundwater	MNA	02 Sampling Crew	64	team/hr	$438	$28,020	1	1	1	annual sampling at 32 existing wells (2 hours per well)	$0	$28,020	$4,203	$2,802	**$35,025**	$3,012	**$38,037**	$5,706	$3,804	**$47,547**	45%	$21,396	**$68,942**	$13,788	$0
-		**MNA - sampling 2 - 5 years**																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	38	EA	$165	$6,270	2	5	1	annual sampling of 38 wells (new + existing)	$0	$6,270	$941	$627	**$7,838**	$674	**$8,512**	$1,277	$851	**$10,639**	45%	$4,788	**$15,427**	$3,085	$0
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	2	5	1	annual sampling of 38 wells (new + existing) (2 hours per sample)	$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
-		**MNA - sampling 6 - 10 years**																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	42	EA	$165	$6,930	6	10	1	years- annual sampling of 42 wells (lab analysis for hexavalent	$0	$6,930	$1,040	$693	**$8,663**	$745	**$9,407**	$1,411	$941	**$11,759**	45%	$5,292	**$17,051**	$3,410	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	6	10	1	years- annual sampling of 42 wells (lab analysis for hexavalent	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-		**MNA - sampling 1 - 5 years (every 5 years)**																								
8	Groundwater	MNA	21 Tritium - Low Level (water)	0	EA	$90	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for tritium)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	02 Sampling Crew	0	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	22 VOCs (Chloroform, TCE) water	0.00	EA	$79	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for TCE and chloroform)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	02 Sampling Crew	0.00	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
-		**100-B-34 RAD - ICs & closeout (Deep Contamination)**					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
1	100-B-34 (Radioactive Process sewer)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	site visits 1 per year, ICs until 2055	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
1	100-B-34 (Radioactive Process sewer)	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	39	39	1	Site closeout-final report for radioactive process sewer portion of 100-B-34 in 2055	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**118-B-8:4 ICs & closeout (Deep Contamination)**					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
5	118-B-8:4	Institutional Controls	850 No dig/drilling institutional control	1.0	EA	$5,978	$5,978	0	150	1	ICs until year 32021 for deep soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
5	118-B-8:4	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	150	150	1	Closout report at year 32021 of MNA	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**116-B-6A ICs & closeout (Deep Contamination)**					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
7	116-B-6A/116-B-16 Tank	Institutional Controls	850 No dig/drilling institutional control	1.0	EA	$5,978	$5,978	0	79	1	Site visits, 1 per year until 2095, assume MNA monitoring is associated with these site visits (79 years).	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	79	79	1	2095 - site closeout	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**MNA - sampling Tritium**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	1	EA	$90	$90	1	20	1	Sample 1 well each year for the first 20 years.	$0	$90	$14	$9	**$113**	$10	**$122**	$18	$12	**$153**	45%	$69	**$221**	$44	$0
8	Groundwater	MNA	02 Sampling Crew	2	team/hr	$438	$876	1	20	1	Sample 1 well each year for the first 20 years, 2 hours per sample.	$0	$876	$131	$88	**$1,095**	$94	**$1,189**	$178	$119	**$1,486**	45%	$669	**$2,154**	$431	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	38	EA	$90	$3,420	21	25	1	Sample 32 existing and 6 new wells.	$0	$3,420	$513	$342	**$4,275**	$368	**$4,643**	$696	$464	**$5,803**	45%	$2,611	**$8,415**	$1,683	$0
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	21	25	1	Sample 32 existing and 6 new wells, 2 hours per sample	$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
-		**ICs and Site Closeout - 23 Deep ROM Sites**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978

10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	67	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	49	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	14	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	59	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	136	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	93	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	121	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	26	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**118-B-1 - ICs & closeout (Shallow Contamination)**					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
4	118-B-1 (burial grd)	Institutional Controls	850 No dig/drilling institutional control	1.0	EA	$5,978	$5,978	0	40	1	ICs until year 2056 for shallow soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
4	118-B-1 (burial grd)	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	40	40	1	Closout report at year 2056 of MNA	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

PERIODIC O&M COST

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-		**MNA - sampling first year (new wells)**									
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	24	EA	$165	$3,960	0	0	1	First year, quarterly sampling in the 6 new wells
8	Groundwater	MNA	02 Sampling Crew	48	team/hr	$438	$21,015	0	0	1	First year, quarterly sampling in the 6 new wells (assume 2 hours per sample)
-		**MNA - sampling out years 11 - 40 for hex chromium**									
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	20	EA	$22	$440	11	40	2	Samples/Event (Out Years) [Years 11-40] 30 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	40	2	Samples/Event (Out Years) [Years 11-40] 30 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium) (2 hours per well for sampling)
-		**MNA - sampling out years 41 - 45 for hex chromium (post remedy)**									
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	42	EA	$22	$924	41	45	1	Samples/Event (Out Years) [Years 41-45] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	41	45	1	Samples/Event (Out Years) [Years 41-45] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium) (2 hours per well for sampling)
-		**MNA - sampling out years 11 - 70 for strantium-90**									
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	20.00	EA	$113	$2,260	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)
8	Groundwater	MNA	02 Sampling Crew	40.00	team/hr	$438	$17,513	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90) (2 hours per well for sampling)
-		**MNA - sampling out years 71 - 75 for strantium-90 (post remedy)**									
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	42	EA	$113	$4,746	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)
8	Groundwater	MNA	02 Sampling Crew	84.00	team/hr	$438	$36,776	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90) (2 hours per well for sampling)
-		**Extraction Wells maintenance**									
8	Groundwater	well maintenance	350 Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	6	EA	$4,499	$26,994	5	35	5	replacing pumps in extraction wells every 5 years
8	Groundwater	well maintenance	365 Pump Setting Crew	12	Crew Hr	$529	$6,344	5	35	5	replacing pumps in extraction wells every 5 years, assume 2 hours per well to replace pumps
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$436,800	25	40	25	replace extraction wells every 25 years
8	Groundwater	well maintenance	351 Well Maintenance Crew	30	Team/Hr	$1,539	$46,158	5	40	5	5 hours per well (extraction) every 5 years to maintain the wells
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$7,000	25	40	25	decommission wells (deep)
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$10,000	25	40	25	decommission wells (shallow)
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$7,000	45	45	1	final decommission wells (deep)
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$10,000	45	45	1	final decommission wells (shallow)
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80.00	HR	$103	$8,247	25	40	25	replace extraction wells every 25 years
8	Groundwater	well maintenance	371 Dispose of drill cuttings	89.80	ton	$83	$7,454	25	40	25	replace extraction wells every 25 years
-		**Injection Wells maintenance**									
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$436,800	15	40	15	replace injection wells every 15 years
8	Groundwater	well maintenance	351 Well Maintenance Crew	20	Team/Hr	$1,539	$30,772	2	44	2	5 hours per well (injection) every 2 years to maintain the wells
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	15	40	15	Decommission Injection Wells every 15 years with replacement
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	45	45	1	final Decommission Injection Wells
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	15	40	15	replace injection wells every 15 years
8	Groundwater	well maintenance	371 Dispose of drill cuttings	60	ton	$83	$4,969	15	40	15	replace injection wells every 15 years
-		**Monitor Wells maintenance**									
8	Groundwater	well maintenance	368 Grundfos MW Pump - 10 gpm, 2" pump	20	EA	$1,500	$30,000	10	75	10	20 wells, replacing pumps every 10 years
8	Groundwater	well maintenance	365 Pump Setting Crew	40	Crew Hr	$529	$21,145	10	75	10	Monitoring well pump replacement (2 hours per well) (assume 20 wells in the outyears)
8	Groundwater	well maintenance	351 Well Maintenance Crew	200	Team/Hr	$1,539	$307,721	10	75	10	Monitoring well rehab every 10 years (10 hours per well) (assume 20 wells in the outyears)

PERIODIC O&M MARKUPS

MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Contingency 15%	Contingency 10%	SUBTOTAL	Technical Support Services Percent	Technical Support Services Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$0	$3,960	$594	$396	**$4,950**	$426	**$5,376**	$806	$538	**$6,720**	45%	$3,024	**$9,743**	$1,949	$0
$0	$21,015	$3,152	$2,102	**$26,269**	$2,259	**$28,528**	$4,279	$2,853	**$35,660**	45%	$16,047	**$51,707**	$10,341	$0
$0	$440	$66	$44	**$550**	$47	**$597**	$90	$60	**$747**	45%	$336	**$1,083**	$217	$0
$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
$0	$924	$139	$92	**$1,155**	$99	**$1,254**	$188	$125	**$1,568**	45%	$706	**$2,273**	$455	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
$0	$2,260	$339	$226	**$2,825**	$243	**$3,068**	$460	$307	**$3,835**	45%	$1,726	**$5,561**	$1,112	$0
$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
$0	$4,746	$712	$475	**$5,933**	$510	**$6,443**	$966	$644	**$8,053**	45%	$3,624	**$11,677**	$2,335	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
$0	$26,994	$4,049	$2,699	**$33,743**	$2,902	**$36,644**	$5,497	$3,664	**$45,805**	45%	$20,612	**$66,418**	$13,284	$0
$0	$6,344	$952	$634	**$7,930**	$682	**$8,611**	$1,292	$861	**$10,764**	45%	$4,844	**$15,608**	$3,122	$0
$0	$436,800	$65,520	$43,680	**$546,000**	$46,956	**$592,956**	$88,943	$59,296	**$741,195**	26%	$192,711	**$933,906**	$186,781	$0
$0	$46,158	$6,924	$4,616	**$57,698**	$0	**$57,698**	$8,655	$5,770	**$72,122**	45%	$32,455	**$104,577**	$20,915	$0
$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
$0	$10,000	$1,500	$1,000	**$12,500**	$1,075	**$13,575**	$2,036	$1,358	**$16,969**	45%	$7,636	**$24,605**	$4,921	$0
$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
$0	$10,000	$1,500	$1,000	**$12,500**	$1,075	**$13,575**	$2,036	$1,358	**$16,969**	45%	$7,636	**$24,605**	$4,921	$0
$0	$8,247	$1,237	$825	**$10,309**	$887	**$11,196**	$1,679	$1,120	**$13,994**	45%	$6,298	**$20,292**	$4,058	$0
$0	$7,454	$1,118	$745	**$9,317**	$801	**$10,118**	$1,518	$1,012	**$12,648**	45%	$5,691	**$18,339**	$3,668	$0
$0	$436,800	$65,520	$43,680	**$546,000**	$46,956	**$592,956**	$88,943	$59,296	**$741,195**	26%	$192,711	**$933,906**	$186,781	$0
$0	$30,772	$4,616	$3,077	**$38,465**	$0	**$38,465**	$5,770	$3,847	**$48,081**	45%	$21,637	**$69,718**	$13,944	$0
$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
$0	$8,247	$1,237	$825	**$10,309**	$887	**$11,196**	$1,679	$1,120	**$13,994**	45%	$6,298	**$20,292**	$4,058	$0
$0	$4,969	$745	$497	**$6,211**	$534	**$6,745**	$1,012	$675	**$8,432**	45%	$3,794	**$12,226**	$2,445	$0
$0	$30,000	$4,500	$3,000	**$37,500**	$3,225	**$40,725**	$6,109	$4,073	**$50,906**	45%	$22,908	**$73,814**	$14,763	$0
$0	$21,145	$3,172	$2,115	**$26,432**	$2,273	**$28,705**	$4,306	$2,870	**$35,881**	45%	$16,146	**$52,028**	$10,406	$0
$0	$307,721	$46,158	$30,772	**$384,651**	$0	**$384,651**	$57,698	$38,465	**$480,814**	33%	$158,668	**$639,482**	$127,896	$0

PERIODIC O&M COST

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	2000	LF	$546	$1,092,000	25	70	25	Monitoring well replacement every 25 years, 20 wells
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	25	70	25	decommission 20 wells for replacement
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	75	75	1	final decommission of 20 wells
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	200.00	HR	$103	$20,618	25	70	25	Monitoring well replacement every 25 years (4 deep (200) + 4 shallow (100) + 10 deep (200)), assume 1 hr per 10 LF for geologist.
8	Groundwater	well maintenance	371 Dispose of drill cuttings	261.92	ton	$83	$21,740	25	70	25	Monitoring well replacement every 25 years (5 deep (200) + 5 shallow (100) + 10 deep (200)). Assume 2,900 lbs per cy. Shallow wells = 5.1611 cy, deep wells = 10.32202 cy
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	375 100-KW refurbishment	1.00	EA	$984,344	$984,344	25	25	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	376 100-KW piping refurbishment	1.00	EA	$12,390	$12,390	25	25	1	10% of 10,000 ft piping costs

PERIODIC O&M MARKUPS

MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Contingency 15%	Contingency 10%	SUBTOTAL	Technical Support Services Percent	Technical Support Services Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$0	$1,092,000	$163,800	$109,200	**$1,365,000**	$117,390	**$1,482,390**	$222,359	$148,239	**$1,852,988**	26%	$481,777	**$2,334,764**	$466,953	$0
$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
$0	$20,618	$3,093	$2,062	**$25,773**	$2,216	**$27,989**	$4,198	$2,799	**$34,986**	45%	$15,744	**$50,730**	$10,146	$0
$0	$21,740	$3,261	$2,174	**$27,174**	$2,337	**$29,511**	$4,427	$2,951	**$36,889**	45%	$16,600	**$53,489**	$10,698	$0
$0	$984,344	$147,652	$98,434	**$1,230,429**	$105,817	**$1,336,246**	$200,437	$133,625	**$1,670,308**	26%	$434,280	**$2,104,588**	$420,918	$0
$0	$12,390	$1,859	$1,239	**$15,488**	$1,332	**$16,819**	$2,523	$1,682	**$21,024**	45%	$9,461	**$30,485**	$6,097	$0

Table B-4. Alternative 5 Cost Estimate Details

Alternative 05
NA with ICs, and RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for GW
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Location:	100-BC-1, 100-BC-2, 100-BC-5	**Base Year:**	2016
Phase:	RI/FS	**Date:**	10/25/2016
Description:	Natural Attenuation with ICs, and RTD for Waste Sites; and Hexavalent Chromium (Cr[VI]) Source Treatment with P&T, and MNA with ICs for Groundwater		

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CAPITAL COSTS

- SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-			**Install new monitoring wells**								
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	600	LF	$546	$327,600	0	0	1	6 new monitoring wells to 100 feet (phase I)
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	400	LF	$546	$218,400	6	6	1	4 new monitoring wells to 100 feet (phase II)
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	60	HR	$103	$6,185	0	0	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	40	HR	$103	$4,124	6	6	1	assume 10 ft per hour based on number of linear feet
8	Groundwater	well drilling	295 Dispose of drill cuttings	44	ton	$83	$3,625	0	0	1	6 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 120 lbs/cy
8	Groundwater	well drilling	295 Dispose of drill cuttings	29	ton	$83	$2,417	6	6	1	4 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 120 lbs/cy
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	6000	LF	$2	$9,000	6	6	1	4 wells, assumed 1,500 LF of power cable for each well
-			**Expansion of 100-KW P&T System**								
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	1	LS	$1,593,940	$1,593,940	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from 300 to 400 GPM)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	1	LS	$2,343,434	$2,343,434	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from 300 to 400 GPM)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$3	$0	0	0	1	3" HDPE Transfer Piping, ft (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$11	$0	0	0	1	8" HDPE Transfer Piping, ft (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	1050 Pipe Fusion Crew (includes testing)	0	team hr	$907	$0	0	0	1	pipe fusion crew to connect pipe lengths, test and place in trench (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	30 McElroy Fusion Machine	0	WK	$225	$0	0	0	1	Weekly rental of fusion machine for fusing pipelines. Using the pipeline fusion crew for time for use of fusion machine (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	100 Project Management Crew	0	Crew Hr	$386	$0	0	0	1	Project management at half time during excavation & pipe fusion (extraction)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	17 Freight for HDPE Pipe	0	trip	$2,500	$0	0	0	1	frieght for pipe for extraction wells, 20 foot length with 54 pipes per load

CAPITAL MARKUPS

MDBI 10%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Project Management Percent	5%	Remedial Design Percent	6%	Construction Management Percent	6%	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$32,760	$360,360	$54,054	$36,036	**$450,450**	$38,739	**$489,189**	$73,378	$48,919	**$611,486**		$30,574		$36,689		$36,689	**$715,438**	$143,088	$0
$21,840	$240,240	$36,036	$24,024	**$300,300**	$25,826	**$326,126**	$48,919	$32,613	**$407,657**		$20,383		$24,459		$24,459	**$476,959**	$95,392	$0
$619	$6,804	$1,021	$680	**$8,505**	$731	**$9,236**	$1,385	$924	**$11,545**		$577		$693		$693	**$13,508**	$2,702	$0
$412	$4,536	$680	$454	**$5,670**	$488	**$6,158**	$924	$616	**$7,697**		$385		$462		$462	**$9,005**	$1,801	$0
$363	$3,988	$598	$399	**$4,985**	$429	**$5,414**	$812	$541	**$6,767**		$338		$406		$406	**$7,918**	$1,584	$0
$242	$2,659	$399	$266	**$3,323**	$286	**$3,609**	$541	$361	**$4,511**		$226		$271		$271	**$5,278**	$1,056	$0
$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**		$1,260		$1,512		$1,512	**$29,482**	$5,896	$0
$900	$9,900	$1,485	$990	**$12,375**	$1,064	**$13,439**	$2,016	$1,344	**$16,799**		$840		$1,008		$1,008	**$19,655**	$3,931	$0
$159,394	$1,753,334	$263,000	$175,333	**$2,191,668**	$0	**$2,191,668**	$328,750	$219,167	**$2,739,584**		$136,979		$164,375		$164,375	**$3,205,314**	$641,063	$0
$234,343	$2,577,777	$386,667	$257,778	**$3,222,222**	$277,111	**$3,499,333**	$524,900	$349,933	**$4,374,166**		$218,708		$262,450		$262,450	**$5,117,774**	$1,023,555	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**		$0		$0		$0	**$0**	$0	$0

-			Extraction wells & equipment																				
8	Groundwater	Extraction Wells	253 Extraction well(s)	900	LF	$535	$481,500	0	0	1	5 shallow (100') + 2 deep (200') (total of 7) - 8" diameter extraction wells	$48,150	$529,650	$79,448	$52,965	**$662,063**	$56,937	**$719,000**	$107,850	$71,900	**$898,750**	$44,937	$53,925	$53,925	**$1,051,537**	$210,307	$0
8	Groundwater	Extraction Wells	275 Pump Assembly	7	EA	$3,200	$22,400	0	0	1	7 pumps for 7 extraction wells	$2,240	$24,640	$3,696	$2,464	**$30,800**	$2,649	**$33,449**	$5,017	$3,345	**$41,811**	$2,091	$2,509	$2,509	**$48,919**	$9,784	$0
8	Groundwater	Extraction Wells	289 Landing Plate	7	EA	$350	$2,450	0	0	1	7 landing plates for 7 extraction wells	$245	$2,695	$404	$270	**$3,369**	$290	**$3,658**	$549	$366	**$4,573**	$229	$274	$274	**$5,351**	$1,070	$0
8	Groundwater	Extraction Wells	271 Riser Pipe	900	LF	$50	$44,586	0	0	1	riser pipe for each well	$4,459	$49,045	$7,357	$4,904	**$61,306**	$5,272	**$66,578**	$9,987	$6,658	**$83,223**	$4,161	$4,993	$4,993	**$97,370**	$19,474	$0
8	Groundwater	Extraction Wells	279 Disconnect Boxes	7	EA	$400	$2,800	0	0	1	7 disconnect boxes for 7 extraction wells	$280	$3,080	$462	$308	**$3,850**	$331	**$4,181**	$627	$418	**$5,226**	$261	$314	$314	**$6,115**	$1,223	$0
8	Groundwater	Extraction Wells	280 Allowance for Electrical Hookups	1	EA	$228	$228	0	0	1	1 allowance for electrical hookups for the 7 extraction wells	$23	$251	$38	$25	**$314**	$27	**$340**	$51	$34	**$426**	$21	$26	$26	**$498**	$100	$0
8	Groundwater	Extraction Wells	266 #10/4C THHN (tray cable)	900	LF	$2	$1,368	0	0	1	200 LF x 7wells	$137	$1,505	$226	$150	**$1,881**	$162	**$2,043**	$306	$204	**$2,553**	$128	$153	$153	**$2,988**	$598	$0
8	Groundwater	Extraction Wells	285 Pump Setting Crew	70	Team/Hr	$529	$37,004	0	0	1	1 - 10 hour days per well x 7 wells	$3,700	$40,705	$6,106	$4,070	**$50,881**	$4,376	**$55,257**	$8,289	$5,526	**$69,071**	$3,454	$4,144	$4,144	**$80,813**	$16,163	$0
8	Groundwater	Extraction Wells	284 Extraction rack	7	EA	$150,000	$1,050,000	0	0	1	1 extraction well rack per well x 7 wells	$105,000	$1,155,000	$173,250	$115,500	**$1,443,750**	$124,163	**$1,567,913**	$235,187	$156,791	**$1,959,891**	$97,995	$117,593	$117,593	**$2,293,072**	$458,614	$0
8	Groundwater	Extraction Wells	10 Drilling Mobilization, completion, cleanup and demob	7	per well	$36,250	$253,750	0	0	1	drilling mob/demob etc per well x 7 wells	$25,375	$279,125	$41,869	$27,913	**$348,906**	$30,006	**$378,912**	$56,837	$37,891	**$473,640**	$23,682	$28,418	$28,418	**$554,159**	$110,832	$0
8	Groundwater	Extraction Wells	268 Water Level Sensor	7	EA	$1,200	$8,400	0	0	1	7 wells x 1 water level sensor	$840	$9,240	$1,386	$924	**$11,550**	$993	**$12,543**	$1,881	$1,254	**$15,679**	$784	$941	$941	**$18,345**	$3,669	$0
8	Groundwater	Extraction Wells	291 10000 Gallon Norwesco Plastic Potable Water Storage Tank	1	EA	$5,870	$5,870	0	0	1	1 - Influent collection tank, 10,000 gallons	$587	$6,457	$969	$646	**$8,071**	$694	**$8,765**	$1,315	$877	**$10,957**	$548	$657	$657	**$12,819**	$2,564	$0
8	Groundwater	Extraction Wells	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	5000	LF	$3	$16,400	0	0	1	3" HDPE Transfer Piping, ft	$1,640	$18,040	$2,706	$1,804	**$22,550**	$1,939	**$24,489**	$3,673	$2,449	**$30,612**	$1,531	$1,837	$1,837	**$35,816**	$7,163	$0
8	Groundwater	Extraction Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPE Transfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Extraction Wells	1050 Pipe Fusion Crew (includes testing)	250	team hr	$907	$226,814	0	0	1	cost for fusion crew working on injection wells	$22,681	$249,496	$37,424	$24,950	**$311,870**	$26,821	**$338,690**	$50,804	$33,869	**$423,363**	$21,168	$25,402	$25,402	**$495,335**	$99,067	$0
8	Groundwater	Extraction Wells	30 McElroy Fusion Machine	6	WK	$225	$1,406	0	0	1	Pipe fusion machine	$141	$1,547	$232	$155	**$1,934**	$166	**$2,100**	$315	$210	**$2,625**	$131	$157	$157	**$3,071**	$614	$0
8	Groundwater	Extraction Wells	110 Excavation Crew (#42) Un-contaminated	250	Crew Hr	$904	$225,991	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$22,599	$248,590	$37,288	$24,859	**$310,737**	$26,723	**$337,461**	$50,619	$33,746	**$421,826**	$21,091	$25,310	$25,310	**$493,536**	$98,707	$0
8	Groundwater	Extraction Wells	100 Project Management Crew	125	Crew Hr	$386	$48,295	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,829	$53,124	$7,969	$5,312	**$66,405**	$5,711	**$72,116**	$10,817	$7,212	**$90,145**	$4,507	$5,409	$5,409	**$105,469**	$21,094	$0
8	Groundwater	Extraction Wells	17 Freight for HDPE Pipe	14	trip	$2,500	$34,722	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,472	$38,194	$5,729	$3,819	**$47,743**	$4,106	**$51,849**	$7,777	$5,185	**$64,811**	$3,241	$3,889	$3,889	**$75,829**	$15,166	$0
8	Groundwater	Extraction Wells	260 Fiber-optic cable and interfaces	10000	FT	$1	$13,300	0	0	1	Fiber Optic Cable	$1,330	$14,630	$2,195	$1,463	**$18,288**	$1,573	**$19,860**	$2,979	$1,986	**$24,825**	$1,241	$1,490	$1,490	**$29,046**	$5,809	$0
8	Groundwater	Extraction Wells	265 Transfer Station (extraction station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Extraction Wells	293 Fiber Optic Splice Box	4	EA	$1,000	$4,000	0	0	1	splice box every 2,500 running feet of fiber cable	$400	$4,400	$660	$440	**$5,500**	$473	**$5,973**	$896	$597	**$7,466**	$373	$448	$448	**$8,736**	$1,747	$0
8	Groundwater	Extraction Wells	294 Geologists/Geophysicists/Hydro - S030	90	HR	$103	$9,278	0	0	1	assume 10 ft per hour based on number of linear feet	$928	$10,206	$1,531	$1,021	**$12,757**	$1,097	**$13,855**	$2,078	$1,385	**$17,318**	$866	$1,039	$1,039	**$20,262**	$4,052	$0
8	Groundwater	Extraction Wells	50 Globe Valve 3"	7	EA	$1,280	$8,959	0	0	1	1 ball valve per well x 7 wells	$896	$9,854	$1,478	$985	**$12,318**	$1,059	**$13,377**	$2,007	$1,338	**$16,722**	$836	$1,003	$1,003	**$19,564**	$3,913	$0
8	Groundwater	Extraction Wells	51 Cable, 4/C #2 Type W	10500	LF	$2	$15,750	0	0	1	7 wells, assumed 1,500 LF of power cable for each well	$1,575	$17,325	$2,599	$1,733	**$21,656**	$1,862	**$23,519**	$3,528	$2,352	**$29,398**	$1,470	$1,764	$1,764	**$34,396**	$6,879	$0
8	Groundwater	Extraction Wells	295 Dispose of drill cuttings	67	ton	$83	$5,590	0	0	1	5 shallow (100')(5.1611 cy x 4) + 2 deep (200')(10.322cy x 2) (total of 7 wells) - 8" diameter extraction wells. 2,900 lbs/cy	$559	$6,149	$922	$615	**$7,687**	$661	**$8,348**	$1,252	$835	**$10,434**	$522	$626	$626	**$12,208**	$2,442	$0

-		**4 new injection wells & equipment & associated Piping**																							
8	Groundwater	Injection Wells	292 SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size ("3.97" I.D.) x **20 ft., †MAX PSI 100 @ 73 Deg. F (PRICE IS PER FOOT. ONLY SOLD IN 20 FT. LENGTHS)	4000	LF	$3	$13,120	0	0	1	4" HDPE Transfer Piping, ft	$1,312	$14,432	$2,165	$1,443	**$18,040**	$1,551	**$19,591**	$2,939	$1,959	**$24,489**	$1,224	$1,469	$1,469	**$28,652**	$5,730	$0
8	Groundwater	Injection Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPETransfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Injection Wells	1050 Pipe Fusion Crew (includes testing)	240	team hr	$907	$217,742	0	0	1	cost for fusion crew working on injection wells	$21,774	$239,516	$35,927	$23,952	**$299,395**	$25,748	**$325,143**	$48,771	$32,514	**$406,428**	$20,321	$24,386	$24,386	**$475,521**	$95,104	$0
8	Groundwater	Injection Wells	30 McElroy Fusion Machine	6	WK	$225	$1,350	0	0	1	Pipe fusion machine	$135	$1,485	$223	$149	**$1,856**	$160	**$2,016**	$302	$202	**$2,520**	$126	$151	$151	**$2,948**	$590	$0
8	Groundwater	Injection Wells	110 Excavation Crew (#42) Un-contaminated	240	Crew Hr	$904	$216,951	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$21,695	$238,646	$35,797	$23,865	**$298,308**	$25,654	**$323,962**	$48,594	$32,396	**$404,953**	$20,248	$24,297	$24,297	**$473,795**	$94,759	$0
8	Groundwater	Injection Wells	100 Project Management Crew	120	Crew Hr	$386	$46,363	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,636	$50,999	$7,650	$5,100	**$63,749**	$5,482	**$69,231**	$10,385	$6,923	**$86,539**	$4,327	$5,192	$5,192	**$101,251**	$20,250	$0
8	Groundwater	Injection Wells	17 Freight for HDPE Pipe	13	trip	$2,500	$32,407	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,241	$35,648	$5,347	$3,565	**$44,560**	$3,832	**$48,392**	$7,259	$4,839	**$60,490**	$3,025	$3,629	$3,629	**$70,774**	$14,155	$0
8	Groundwater	Injection Wells	254 Injection Well(s)	800	LF	$535	$428,000	0	0	1	4 injection wells drilled down to 200 LF	$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**	$39,944	$47,933	$47,933	**$934,700**	$186,940	$0
8	Groundwater	Injection Wells	264 Transfer Station (injection station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Injection Wells	289 Landing Plate	4	EA	$350	$1,400	0	0	1	4 landing plates, 1 for each injection well	$140	$1,540	$231	$154	**$1,925**	$166	**$2,091**	$314	$209	**$2,613**	$131	$157	$157	**$3,057**	$611	$0
8	Groundwater	Injection Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	200 LF x 4 injection wells	$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**	$3,699	$4,439	$4,439	**$86,551**	$17,310	$0
8	Groundwater	Injection Wells	285 Pump Setting Crew	40	Team/Hr	$529	$21,145	0	0	1	10 hours per well x 4 wells for injection wells (using pump setting crew to cost installation of injection racks)	$2,115	$23,260	$3,489	$2,326	**$29,075**	$2,500	**$31,575**	$4,736	$3,158	**$39,469**	$1,973	$2,368	$2,368	**$46,179**	$9,236	$0
8	Groundwater	Injection Wells	283 Injection Rack	4	EA	$40,000	$160,000	0	0	1	1 injection rack per injection well x 4 wells	$16,000	$176,000	$26,400	$17,600	**$220,000**	$18,920	**$238,920**	$35,838	$23,892	**$298,650**	$14,933	$17,919	$17,919	**$349,421**	$69,884	$0
8	Groundwater	Injection Wells	10 Drilling Mobilization, completion, cleanup and demob	4	per well	$36,250	$145,000	0	0	1	4 wells x mob/demob of crew	$14,500	$159,500	$23,925	$15,950	**$199,375**	$17,146	**$216,521**	$32,478	$21,652	**$270,652**	$13,533	$16,239	$16,239	**$316,662**	$63,332	$0
8	Groundwater	Injection Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	assume 10 ft per hour based on number of linear feet	$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**	$770	$924	$924	**$18,011**	$3,602	$0
8	Groundwater	Injection Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	4 deep (200')(10.322cy x 4) - 8" diameter extraction wells. 2,900 lbs/cy	$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**	$464	$556	$556	**$10,852**	$2,170	$0
-		**Insitu Reduction (ISR) for Chromium**																							
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	507 Mobilize & Reburbish Skids	1	LS	$34,891	$34,891	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$3,489	$38,380	$5,757	$3,838	**$47,975**	$4,126	**$52,101**	$7,815	$5,210	**$65,126**	$3,256	$3,908	$3,908	**$76,197**	$15,239	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	508 Sampling Support	1	LS	$105,243	$105,243	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$10,524	$115,768	$17,365	$11,577	**$144,709**	$12,445	**$157,154**	$23,573	$15,715	**$196,443**	$9,822	$11,787	$11,787	**$229,838**	$45,968	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	509 Install Injection System and Inject	1	LS	$255,299	$255,299	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$25,530	$280,829	$42,124	$28,083	**$351,036**	$30,189	**$381,225**	$57,184	$38,123	**$476,531**	$23,827	$28,592	$28,592	**$557,542**	$111,508	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	510 Demobilize	1	LS	$24,336	$24,336	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$2,434	$26,770	$4,015	$2,677	**$33,462**	$2,878	**$36,340**	$5,451	$3,634	**$45,425**	$2,271	$2,725	$2,725	**$53,147**	$10,629	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	511 Drilling	1	LS	$218,780	$218,780	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607. This cost includes disposal of cuttings and drilling oversight.	$21,878	$240,658	$36,099	$24,066	**$300,823**	$25,871	**$326,693**	$49,004	$32,669	**$408,367**	$20,418	$24,502	$24,502	**$477,789**	$95,558	$0
-		**Excavation - site 118-B-8:4**																							
5	118-B-8:4	Excavation	111 Excavation Crew (#43) Contaminated	0	Crew Hr	$1,223	$0	0	0	1	excavation during contaminated areas based on cy/60hrs	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	0	0	1	excavation during uncontaminated areas based on cy/180hrs	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	0	0	1	excavator time based on crew time for excavating contaminated soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	113 Excavator (Un-contaminated)	0	MO	$5,200	$0	0	0	1	excavator time based on crew time for excavating non contaminated soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	0	EA	$165	$0	0	0	1	analytical during excavaion to verify clean based on SF/6724	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0

-		**ERDF Disposal & Backfill - site 118-B-8:4**																							
5	118-B-8:4	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	0	EA	$497	$0	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	90	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	811 ERDF WG	0	Ton	$83	$0	0	0	1	CY of contaminated soild going to ERDF		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	133 Backfill and soil cover crew (#46)	0	Crew Hr	$1,359	$0	0	0	1	backfill crew based on cy/185		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill					$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	112 DumpTrucks	0	MO	$6,200	$0	0	0	1	Trucks from borrow pit		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	134 Front End Loader	0	MO	$15,500	$0	0	0	1	front end loader to deliver and sprad backfill soil		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	137 Water Truck	0	MO	$6,200	$0	0	0	1	water truck		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	139 Revegetate area	0	Ac	$5,010	$0	0	0	1	revegetate area		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4						$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$0	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	0	HR	$70	$0	0	0	1	truck drivers		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	0	HR	$70	$0	0	0	1	operators for water truck and front end loader		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	118 Fuel - Diesel	0	gal	$4	$0	0	0	1	Fuel		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Excavation	119 Fuel Delivery	0	gal	$2	$0	0	0	1	Fuel Delivery		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
-		**Excavation - site 100-B-34 Dichromate Transfer Line**											$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	110 Excavation Crew (#42) Un-contaminated	87	Crew Hr	$904	$79,046	0	0	1			$7,905	$86,951	$13,043	$8,695	**$108,689**	$9,347	**$118,036**	$17,705	$11,804	**$147,545**	$7,377	$8,853	$8,853	**$172,628**	$34,526	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	111 Excavation Crew (#43) Contaminated	4	Crew Hr	$1,223	$5,301	0	0	1			$530	$5,831	$875	$583	**$7,288**	$627	**$7,915**	$1,187	$792	**$9,894**	$495	$594	$594	**$11,576**	$2,315	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$2,983	0	0	1			$298	$3,281	$492	$328	**$4,101**	$353	**$4,454**	$668	$445	**$5,568**	$278	$334	$334	**$6,514**	$1,303	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	05 OPERATOR GROUP VIII	92	HR	$70	$6,420	0	0	1	operators for the excavator		$642	$7,062	$1,059	$706	**$8,828**	$759	**$9,587**	$1,438	$959	**$11,984**	$599	$719	$719	**$14,021**	$2,804	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	145 Move water main	0	LS	$1,200,000	$420,000	0	0	1	Move fire supression line above dichromate transfer lines		$42,000	$462,000	$69,300	$46,200	**$577,500**	$49,665	**$627,165**	$94,075	$62,717	**$783,956**	$39,198	$47,037	$47,037	**$917,229**	$183,446	$0
-		**Sampling & Analysis: 100-B-34 - Dichromate Transfer Line**											$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for dichromate (2 hours per sample)		$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**	$82	$98	$98	**$1,912**	$382	$0
2	100-B-34 (Dichromate Transfer Line)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1			$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**Backfill & Disposal: 100-B-34 - Dichromate Transfer Line**											$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	133 Backfill and soil cover crew (#46)	203.4	Crew Hr	$1,359	$276,493	0	0	1			$27,649	$304,142	$45,621	$30,414	**$380,178**	$32,695	**$412,873**	$61,931	$41,287	**$516,091**	$25,805	$30,965	$30,965	**$603,827**	$120,765	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1			$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	811 ERDF WG	19.5	Ton	$83	$1,616	0	0	1			$162	$1,778	$267	$178	**$2,222**	$191	**$2,413**	$362	$241	**$3,016**	$151	$181	$181	**$3,529**	$706	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	112 DumpTrucks	1	MO	$6,200	$3,556	0	0	1			$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	134 Front End Loader	1	MO	$15,500	$8,891	0	0	1			$889	$9,780	$1,467	$978	**$12,225**	$1,051	**$13,276**	$1,991	$1,328	**$16,596**	$830	$996	$996	**$19,417**	$3,883	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	137 Water Truck	1	MO	$6,200	$3,556	0	0	1			$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	139 Revegetate area	0.39	Ac	$5,010	$1,953	0	0	1			$195	$2,148	$322	$215	**$2,685**	$231	**$2,916**	$437	$292	**$3,645**	$182	$219	$219	**$4,264**	$853	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	819 Survey Tent	0.35	LS	$120,000	$42,000	0	0	1			$4,200	$46,200	$6,930	$4,620	**$57,750**	$4,967	**$62,717**	$9,407	$6,272	**$78,396**	$3,920	$4,704	$4,704	**$91,723**	$18,345	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0.3	Crew Hr	$232	$69	0	0	1			$7	$76	$11	$8	**$95**	$0	**$95**	$14	$10	**$119**	$6	$7	$7	**$140**	$28	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	120 Fuel Charge	203.4	Hr	$16	$3,336	0	0	1			$334	$3,669	$550	$367	**$4,587**	$394	**$4,981**	$747	$498	**$6,226**	$311	$374	$374	**$7,285**	$1,457	$0
-		**Expansion of 100-KW P&T System Prior to Startup**											$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	0.25	LS	$1,593,940	$398,485	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)		$39,849	$438,334	$65,750	$43,833	**$547,917**	$0	**$547,917**	$82,188	$54,792	**$684,896**	$34,245	$41,094	$41,094	**$801,328**	$160,266	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	0.25	LS	$2,343,434	$585,859	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)		$58,586	$644,444	$96,667	$64,444	**$805,555**	$69,278	**$874,833**	$131,225	$87,483	**$1,093,542**	$54,677	$65,612	$65,612	**$1,279,444**	$255,889	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	296 pH Adjustment	1	EA	$610,000	$610,000	0	0	1	Cost for adding pH adjustment capability to 100-KW P&T		$61,000	$671,000	$100,650	$67,100	**$838,750**	$72,133	**$910,883**	$136,632	$91,088	**$1,138,603**	$56,930	$68,316	$68,316	**$1,332,166**	$266,433	$0

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ANNUAL O&M COST												ANNUAL O&M MARKUPS														
SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES	MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Technical Support Services Percent	Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
-		100-B-34 RAD ICs (Deep Contamination)																								
1	100-B-34 (Radioactive Process sewer)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	site visits 1 per year, ICs until 2055	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
-		118-B-1 - ICs & closeout (Deep Contamination)																								
4	118-B-1 (burial grd)	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	65	1	Site visits once a year, ICs 2040 (shallow), 2081 (deep), and no irrigation IC until 2049	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
4	118-B-1 (burial grd)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	65	65	1	Site Closeout-final report 2081	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		ICs & closeout 116-B-5 (crib)																								
6	116-B-5 (crib)	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	5	1	Site visits, 1 per year until 2021, assume MNA monitoring is associated with these site visits (5 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
6	116-B-5 (crib)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	5	5	1	2021 - site closeout	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		116-B-6A ICs & closeout (Deep Contamination)																								
7	116-B-6A/116-B-16 Tank	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	79	1	Site visits, 1 per year until 2095. Excavation ICs until year 2045 (shallow)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	79	79	1	2095 - site closeout	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		MNA & ICs for Groundwater																								
8	Groundwater	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	75	1	Institutional controls for 150 years starting in 2016	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
-		P&T for 15 years																								
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	356 100 KX Pump & Treat Operating Cost	1	per year	$129,524	$129,524	0	15	1	Assumes Cr(VI) < 10 ug/L after 15 Years of Pump and Treat. Assumes 5 years of post-P&T monitoring for Cr(VI).	$0	$129,524	$19,429	$12,952	**$161,905**	$13,924	**$175,829**	$26,374	$17,583	**$219,786**	33%	$72,529	**$292,315**	$58,463	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	355 100KX resin cost	207,360,000	per gal	$0.0008	$165,888	0	15	1	resin cost per year, see backup cost tab for more info, "BKUP" (207,360,000 gallons per year is number of gallons at 400gpm)	$0	$165,888	$24,883	$16,589	**$207,360**	$17,833	**$225,193**	$33,779	$22,519	**$281,491**	33%	$92,892	**$374,383**	$74,877	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	400	gpm	$2,187	$874,800	1	15	1	Annual maintenance of P&T system	$0	$874,800	$131,220	$87,480	**$1,093,500**	$94,041	**$1,187,541**	$178,131	$118,754	**$1,484,426**	26%	$385,951	**$1,870,377**	$374,075	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	40	gpm	$2,187	$87,480	1	15	1	Annual cost for pH adjustment	$0	$87,480	$13,122	$8,748	**$109,350**	$9,404	**$118,754**	$17,813	$11,875	**$148,443**	33%	$48,986	**$197,429**	$39,486	$0
-		MNA - sampling first year (existing wells)																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	32	EA	$165	$5,280	1	1	1	annual sampling at 32 existing wells	$0	$5,280	$792	$528	**$6,600**	$568	**$7,168**	$1,075	$717	**$8,960**	45%	$4,032	**$12,991**	$2,598	$0
8	Groundwater	MNA	02 Sampling Crew	64	team/hr	$438	$28,020	1	1	1	annual sampling at 32 existing wells (2 hours per well)	$0	$28,020	$4,203	$2,802	**$35,025**	$3,012	**$38,037**	$5,706	$3,804	**$47,547**	45%	$21,396	**$68,942**	$13,788	$0
-		MNA - sampling 2 - 5 years																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	38	EA	$165	$6,270	2	5	1	annual sampling of 38 wells (new + existing)	$0	$6,270	$941	$627	**$7,838**	$674	**$8,512**	$1,277	$851	**$10,639**	45%	$4,788	**$15,427**	$3,085	$0
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	2	5	1	annual sampling of 38 wells (new + existing) (2 hours per sample)	$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
-		MNA - sampling 6 - 10 years																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	42	EA	$165	$6,930	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90)	$0	$6,930	$1,040	$693	**$8,663**	$745	**$9,407**	$1,411	$941	**$11,759**	45%	$5,292	**$17,051**	$3,410	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90) (2 hours per well for sampling)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	0	EA	$90	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for tritium)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	02 Sampling Crew	0	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	22 VOCs (Chloroform, TCE) water	0.00	EA	$79	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for TCE and chloroform)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	02 Sampling Crew	0.00	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
-		116-C-1 ICs & closeout (Deep Contamination)																								
3	116-C-1	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	150	1	Site visits once a year, ICs until 2485. Irrigation ICs until 2034	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
3	116-C-1	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	Site Closeout-final report 2485	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
		Closeout for 100-B-34 Radioactive Process Sewer										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
1	100-B-34 (Radioactive Process sewer)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	Site closeout-final report for radioactive process sewer portion of 100-B-34 in 2055	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		118-B-8:4 - ICs & closeout (Deep Contamination)										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
5	118-B-8:4	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	Site visits, 1 per year for 187 years, assume MNA monitoring is associated with these site visits (187 years) for shallow soils, ICs until 32021 for deep soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978

5	118-B-8:4	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	Closout report at year 32021 of MNA	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-			**MNA - sampling Tritium**									$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	1	EA	$90	$90	1	34	1	Sample 1 well each year for the first 34 years.	$0	$90	$14	$9	**$113**	$10	**$122**	$18	$12	**$153**	45%	$69	**$221**	$44	$0
8	Groundwater	MNA	02 Sampling Crew	2	team/hr	$438	$876	1	34	1	Sample 1 well each year for the first 34 years, 2 hours per sample.	$0	$876	$131	$88	**$1,095**	$94	**$1,189**	$178	$119	**$1,486**	45%	$669	**$2,154**	$431	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	38	EA	$90	$3,420	35	40	1	Sample 32 existing and 6 new wells.	$0	$3,420	$513	$342	**$4,275**	$368	**$4,643**	$696	$464	**$5,803**	45%	$2,611	**$8,415**	$1,683	$0
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	35	40	1	Sample 32 existing and 6 new wells, 2 hours per sample	$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
-			**ICs and Site Closeout- 23 Deep ROM Sites**									$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	67	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	49	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	14	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	59	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	136	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	93	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	121	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	26	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

PERIODIC O&M COST												PERIODIC O&M MARKUPS														
-		WBS				UNIT		START	END			MDBI		Overhead	Profit		WA States Sales Tax		Contingency			Technical Support Services			CHPRC G&A	Institutional
SITE	SITE NAME	Top Tier	DESCRIPTION	QTY	UNIT	COST	SUBTOTAL	YEAR	YEAR	INTERVAL	NOTES	0%	SUBTOTAL	15%	10%	SUBTOTAL	8.6%	SUBTOTAL	15%	10%	SUBTOTAL	Percent	Subtotal	SUBTOTAL	20.00%	Controls
-			**MNA - sampling first year (new wells)**																							
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	24	EA	$165	$3,960	0	0	1	First year, quarterly sampling in the 6 new wells	$0	$3,960	$594	$396	**$4,950**	$426	**$5,376**	$806	$538	**$6,720**	45%	$3,024	**$9,743**	$1,949	$0
8	Groundwater	MNA	02 Sampling Crew	48	team/hr	$438	$21,015	0	0	1	First year, quarterly sampling in the 6 new wells (assume 2 hours per sample)	$0	$21,015	$3,152	$2,102	**$26,269**	$2,259	**$28,528**	$4,279	$2,853	**$35,660**	45%	$16,047	**$51,707**	$10,341	$0
-			**MNA - sampling out years 11 - 15 for hex chromium**																							
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	20	EA	$22	$440	11	15	2	Samples/Event (Out Years) [Years 11-15] 5 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$440	$66	$44	**$550**	$47	**$597**	$90	$60	**$747**	45%	$336	**$1,083**	$217	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	15	2	Samples/Event (Out Years) [Years 11-15] 5 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
-			**MNA - sampling out years 16 - 20 for hex chromium (post remedy)**																							
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	42	EA	$22	$924	16	20	1	Samples/Event (Out Years) [Years 16-20] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$924	$139	$92	**$1,155**	$99	**$1,254**	$188	$125	**$1,568**	45%	$706	**$2,273**	$455	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	16	20	1	Samples/Event (Out Years) [Years 16-20] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-			**MNA - sampling out years 11 - 70 for strantium-90**																							
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	20	EA	$113	$2,260	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$2,260	$339	$226	**$2,825**	$243	**$3,068**	$460	$307	**$3,835**	45%	$1,726	**$5,561**	$1,112	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
-			**MNA - sampling out years 71 - 75 for strantium-90 (post remedy)**																							
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	42	EA	$113	$4,746	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$4,746	$712	$475	**$5,933**	$510	**$6,443**	$966	$644	**$8,053**	45%	$3,624	**$11,677**	$2,335	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-			**Extraction Wells maintenance**																							
8	Groundwater	well maintenance	350 Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	7	EA	$4,499	$31,493	5	15	5	replacing pumps in extraction wells every 5 years	$0	$31,493	$4,724	$3,149	**$39,366**	$3,385	**$42,752**	$6,413	$4,275	**$53,440**	45%	$24,048	**$77,488**	$15,498	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	14	Crew Hr	$529	$7,401	5	15	5	replacing pumps in extraction wells every 5 years, assume 2 hours per well to replace pumps	$0	$7,401	$1,110	$740	**$9,251**	$796	**$10,047**	$1,507	$1,005	**$12,558**	45%	$5,651	**$18,210**	$3,642	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	900	LF	$546	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	30	Team/Hr	$1,539	$46,158	5	15	5	5 hours per well (extraction) every 5 years to maintain the wells	$0	$46,158	$6,924	$4,616	**$57,698**	$0	**$57,698**	$8,655	$5,770	**$72,122**	45%	$32,455	**$104,577**	$20,915	$0
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$0				decommission wells (deep) (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$0				decommission wells (shallow) (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$7,000	15	15	1	final decommission wells (deep)	$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$10,000	15	15	1	final decommission wells (shallow)	$0	$10,000	$1,500	$1,000	**$12,500**	$1,075	**$13,575**	$2,036	$1,358	**$16,969**	45%	$7,636	**$24,605**	$4,921	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	90.00	HR	$103	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	89.80	ton	$83	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
-			**Injection Wells maintenance**									$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$0				replace injection wells every 15 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	20	Team/Hr	$1,539	$30,772	2	15	2	5 hours per well (injection) every 2 years to maintain the wells	$0	$30,772	$4,616	$3,077	**$38,465**	$0	**$38,465**	$5,770	$3,847	**$48,081**	45%	$21,637	**$69,718**	$13,944	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$0				Decommission Injection Wells every 15 years with replacement (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	15	15	1	final Decommission Injection Wells	$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$0				replace injection wells every 15 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	60	ton	$83	$0				replace injection wells every 15 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0

PERIODIC O&M COST												PERIODIC O&M MARKUPS															
-		WBS				UNIT		START	END			MDBI		Overhead	Profit		WA States Sales Tax		Contingency			Technical Support Services			CHPRC G&A	Institutional
SITE	SITE NAME	Top Tier	DESCRIPTION	QTY	UNIT	COST	SUBTOTAL	YEAR	YEAR	INTERVAL	NOTES	0%	SUBTOTAL	15%	10%	SUBTOTAL	8.6%	SUBTOTAL	15%	10%	SUBTOTAL	Percent	Subtotal	SUBTOTAL	20.00%	Controls
-			Monitor Wells maintenance																								
8	Groundwater	well maintenance	368 Grundfos MW Pump - 10 gpm, 2" pump	20	EA	$1,500	$30,000	10	75	10	20 wells, replacing pumps every 10 years, assume 2 hours per well to replace pumps (monitoring wells)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	40	Crew Hr	$529	$21,145	10	75	10	Monitoring well pump replacement (2 hours per well) (assume 20 wells in the outyears)	$0	$30,000	$4,500	$3,000	**$37,500**	$3,225	**$40,725**	$6,109	$4,073	**$50,906**	45%	$22,908	**$73,814**	$14,763	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	200	Team/Hr	$1,539	$307,721	10	75	10	Monitoring well replacement every 25 years, 20 wells	$0	$21,145	$3,172	$2,115	**$26,432**	$2,273	**$28,705**	$4,306	$2,870	**$35,881**	45%	$16,146	**$52,028**	$10,406	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	2000	LF	$546	$1,092,000	25	75	25	Monitoring well replacement every 25 years, 20 wells	$0	$307,721	$46,158	$30,772	**$384,651**	$0	**$384,651**	$57,698	$38,465	**$480,814**	33%	$158,668	**$639,482**	$127,896	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	25	75	25	decommission 20 wells for replacement	$0	$1,092,000	$163,800	$109,200	**$1,365,000**	$117,390	**$1,482,390**	$222,359	$148,239	**$1,852,988**	26%	$481,777	**$2,334,764**	$466,953	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	75	75	1	final decommission of 20 wells	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	200.00	HR	$103	$20,618	25	75	25	Monitoring well replacement every 25 years (4 deep (200) + 4 shallow (100) + 10 deep (200)), assume 1 hr per 10 LF for geologist.	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	261.92191	ton	$83	$21,740	25	75	25	Monitoring well replacement every 25 years (4 deep (200) + 4 shallow (100) + 10 deep (200)). Assume 2,900 lbs per cy. Shallow wells = 5.1611 cy, deep wells = 10.32202 cy	$0	$20,618	$3,093	$2,062	**$25,773**	$2,216	**$27,989**	$4,198	$2,799	**$34,986**	45%	$15,744	**$50,730**	$10,146	$0
												$0	$21,740	$3,261	$2,174	**$27,174**	$2,337	**$29,511**	$4,427	$2,951	**$36,889**	45%	$16,600	**$53,489**	$10,698	$0

Table B-5. Alternative 6 Cost Estimate Details

Alternative 06

NA with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T and MNA with ICs for GW

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Location:	100-BC-1, 100-BC-2, 100-BC-5	**Base Year:**	2016
Phase:	RI/FS	**Date:**	10/25/2016
Description:	Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) Source Treatment with P&T, and MNA with ICs for Groundwater		

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CAPITAL COSTS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-			**Excavation - Site 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Excavation	110 Excavation Crew (#42) Un-contaminated	153	Crew Hr	$904	$138,267	0	0	1	2 - 50 foot segments of pipe reroute water lines, non contaminated soil removal
1	100-B-34 (Radioactive Process sewer)	Excavation	111 Excavation Crew (#43) Contaminated	2	Crew Hr	$1,223	$1,953	0	0	1	2 - 50 foot segments of pipe reroute water lines, non contaminated soil removal
1	100-B-34 (Radioactive Process sewer)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$5,023	0	0	1	excavator per month based on crew hours for the 2 - 50 foot pipes
2	100-B-34 (Dichromate Transfer Line)	Excavation	110 Excavation Crew (#42) Un-contaminated	87	Crew Hr	$904	$79,046	0	0	1	1 - 55 ft pipe segment 6 ft below ground
2	100-B-34 (Dichromate Transfer Line)	Excavation	111 Excavation Crew (#43) Contaminated	4	Crew Hr	$1,223	$5,301	0	0	1	1 - 55 ft pipe segment 6 ft below ground (assume a minum of 5 hours)
2	100-B-34 (Dichromate Transfer Line)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$2,983	0	0	1	excavator per month based on crew hours for the 1 - 55 foot pipes
1	100-B-34 (Radioactive Process sewer)	Excavation	118 Fuel - Diesel	118	gal	$4	$431	0	0	1	excavator fuel (assume 3.1 gph)
1	100-B-34 (Radioactive Process sewer)	Excavation	119 Fuel Delivery	118	gal	$2	$210	0	0	1	fuel delivery
1	100-B-34 (Radioactive Process sewer)	Excavation	05 OPERATOR GROUP VIII	155	HR	$70	$10,812	0	0	1	operators for the excavators for both 3 pipelines
1	100-B-34 (Radioactive Process sewer)	Excavation	145 Move water main	1	LS	$1,200,000	$780,000	0	0	1	Move water main above sewer lines
-			**Sampling & Analysis: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for 2 lines (2 hours per sample)
2	100-B-34 (Dichromate Transfer Line)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for dichromate (2 hours per sample)
1	100-B-34 (Radioactive Process sewer)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analysis for 2 lines
2	100-B-34 (Dichromate Transfer Line)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analysis for dichromate line
-			**Backfill: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Backfill	133 Backfill and soil cover crew (#46)	133	Crew Hr	$1,359	$180,532	0	0	1	backfill crew, assume LCY/185 hrs (2 segments of pipe)
2	100-B-34 (Dichromate Transfer Line)	Backfill	133 Backfill and soil cover crew (#46)	203	Crew Hr	$1,359	$276,493	0	0	1	backfill crew, assume LCY/185 hrs (dichromate transfer line)
-			**ERDF Disposal: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (2 segments)
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (dichromate transfer line)
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	811 ERDF WG	125	Ton	$83	$10,339	0	0	1	disposal of soil from 2 - pipe segments
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	811 ERDF WG	19	Ton	$83	$1,616	0	0	1	disposal of soil from dichromate transfer line
1	100-B-34 (Radioactive Process sewer)	Backfill	120 Fuel Charge	132.80	Hr	$16	$2,178	0	0	1	fuel during backfill based on cubic feet of backfill
-			**Excavation - Site 116-C-1**								
3	116-C-1	Excavation	111 Excavation Crew (#43) Contaminated	1,647	Crew Hr	$1,223	$2,014,015	0	0	1	excavation during contaminated areas based on cy/60hrs
3	116-C-1	Excavation	110 Excavation Crew (#42) Un-contaminated	1,920	Crew Hr	$904	$1,735,340	0	0	1	excavation during uncontaminated areas based on cy/180hrs
3	116-C-1	Excavation	114 Excavator (Contaminated)	10	MO	$5,200	$53,512	0	0	1	excavator time based on crew time for excavating contaminated soil
3	116-C-1	Excavation	113 Excavator (Un-contaminated)	12	MO	$5,200	$62,390	0	0	1	excavator time based on crew time for excavating non contaminated soil

CAPITAL MARKUPS

MDBI 10%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Project Management Percent 5%	Remedial Design Percent 6%	Construction Management Percent 6%	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$13,827	$152,094	$22,814	$15,209	**$190,117**	$16,350	**$206,467**	$30,970	$20,647	**$258,084**	$12,904	$15,485	$15,485	**$301,959**	$60,392	$0
$195	$2,149	$322	$215	**$2,686**	$231	**$2,917**	$438	$292	**$3,646**	$182	$219	$219	**$4,266**	$853	$0
$502	$5,525	$829	$553	**$6,907**	$594	**$7,501**	$1,125	$750	**$9,376**	$469	$563	$563	**$10,970**	$2,194	$0
$7,905	$86,951	$13,043	$8,695	**$108,689**	$9,347	**$118,036**	$17,705	$11,804	**$147,545**	$7,377	$8,853	$8,853	**$172,628**	$34,526	$0
$530	$5,831	$875	$583	**$7,288**	$627	**$7,915**	$1,187	$792	**$9,894**	$495	$594	$594	**$11,576**	$2,315	$0
$298	$3,281	$492	$328	**$4,101**	$353	**$4,454**	$668	$445	**$5,568**	$278	$334	$334	**$6,514**	$1,303	$0
$43	$474	$71	$47	**$593**	$51	**$644**	$97	$64	**$805**	$40	$48	$48	**$942**	$188	$0
$21	$231	$35	$23	**$289**	$25	**$314**	$47	$31	**$393**	$20	$24	$24	**$459**	$92	$0
$1,081	$11,893	$1,784	$1,189	**$14,866**	$1,278	**$16,144**	$2,422	$1,614	**$20,181**	$1,009	$1,211	$1,211	**$23,611**	$4,722	$0
$78,000	$858,000	$128,700	$85,800	**$1,072,500**	$92,235	**$1,164,735**	$174,710	$116,474	**$1,455,919**	$72,796	$87,355	$87,355	**$1,703,425**	$340,685	$0
$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**	$82	$98	$98	**$1,912**	$382	$0
$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**	$82	$98	$98	**$1,912**	$382	$0
$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
$18,053	$198,585	$29,788	$19,859	**$248,232**	$21,348	**$269,580**	$40,437	$26,958	**$336,975**	$16,849	$20,218	$20,218	**$394,260**	$78,852	$0
$27,649	$304,142	$45,621	$30,414	**$380,178**	$32,695	**$412,873**	$61,931	$41,287	**$516,091**	$25,805	$30,965	$30,965	**$603,827**	$120,765	$0
$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
$1,034	$11,373	$1,706	$1,137	**$14,216**	$1,223	**$15,439**	$2,316	$1,544	**$19,299**	$965	$1,158	$1,158	**$22,580**	$4,516	$0
$162	$1,778	$267	$178	**$2,222**	$191	**$2,413**	$362	$241	**$3,016**	$151	$181	$181	**$3,529**	$706	$0
$218	$2,396	$359	$240	**$2,995**	$258	**$3,252**	$488	$325	**$4,065**	$203	$244	$244	**$4,756**	$951	$0
$201,401	$2,215,416	$332,312	$221,542	**$2,769,270**	$238,157	**$3,007,427**	$451,114	$300,743	**$3,759,284**	$187,964	$225,557	$225,557	**$4,398,363**	$879,673	$0
$173,534	$1,908,874	$286,331	$190,887	**$2,386,093**	$205,204	**$2,591,297**	$388,694	$259,130	**$3,239,121**	$161,956	$194,347	$194,347	**$3,789,771**	$757,954	$0
$5,351	$58,863	$8,829	$5,886	**$73,579**	$6,328	**$79,906**	$11,986	$7,991	**$99,883**	$4,994	$5,993	$5,993	**$116,863**	$23,373	$0
$6,239	$68,629	$10,294	$6,863	**$85,787**	$7,378	**$93,164**	$13,975	$9,316	**$116,455**	$5,823	$6,987	$6,987	**$136,253**	$27,251	$0

3	116-C-1	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	18	EA	$165	$2,936	0	0	1	analytical during excavaion to verify clean based on SF/6724		$294	$3,230	$484	$323	**$4,037**	$347	**$4,384**	$658	$438	**$5,480**	$274	$329	$329	**$6,412**	$1,282	$0
-		**ERDF Disposal & Backfill - Site 116-C-1**																										
3	116-C-1	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	99	EA	$497	$49,099	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification		$4,910	$54,009	$8,101	$5,401	**$67,511**	$5,806	**$73,317**	$10,998	$7,332	**$91,646**	$4,582	$5,499	$5,499	**$107,226**	$21,445	$0
3	116-C-1	ERDF Disposal	811 ERDF WG	128,428	Ton	$83	$10,659,534	0	0	1	CY of contaminated soild going to ERDF	9,879.09	$1,065,953	$11,725,487	$1,758,823	$1,172,549	**$14,656,859**	$1,260,490	**$15,917,349**	$2,387,602	$1,591,735	**$19,896,686**	$994,834	$1,193,801	$1,193,801	**$23,279,123**	$4,655,825	$0
3	116-C-1	Backfill	133 Backfill and soil cover crew (#46)	2,194	Crew Hr	$1,359	$2,982,872	0	0	1	backfill crew based on cy/185		$298,287	$3,281,159	$492,174	$328,116	**$4,101,448**	$352,725	**$4,454,173**	$668,126	$445,417	**$5,567,716**	$278,386	$334,063	$334,063	**$6,514,228**	$1,302,846	$0
3	116-C-1	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
3	116-C-1	Backfill	112 DumpTrucks	14	MO	$6,200	$85,029	0	0	1	Trucks from borrow pit		$8,503	$93,532	$14,030	$9,353	**$116,914**	$10,055	**$126,969**	$19,045	$12,697	**$158,711**	$7,936	$9,523	$9,523	**$185,692**	$37,138	$0
3	116-C-1	Backfill	134 Front End Loader	36	MO	$15,500	$558,049	0	0	1	front end loader to deliver and spread backfill soil		$55,805	$613,854	$92,078	$61,385	**$767,317**	$65,989	**$833,307**	$124,996	$83,331	**$1,041,633**	$52,082	$62,498	$62,498	**$1,218,711**	$243,742	$0
3	116-C-1	Backfill	137 Water Truck	36	MO	$6,200	$223,220	0	0	1	water truck (entire length of project)		$22,322	$245,542	$36,831	$24,554	**$306,927**	$26,396	**$333,323**	$49,998	$33,332	**$416,653**	$20,833	$24,999	$24,999	**$487,484**	$97,497	$0
3	116-C-1	Backfill	139 Revegetate area	7	Ac	$5,010	$35,920	0	0	1	revegetate area		$3,592	$39,512	$5,927	$3,951	**$49,390**	$4,248	**$53,638**	$8,046	$5,364	**$67,048**	$3,352	$4,023	$4,023	**$78,446**	$15,689	$0
3	116-C-1	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$120,000	0	0	1	survey tent $120000 (allowance)		$12,000	$132,000	$19,800	$13,200	**$165,000**	$14,190	**$179,190**	$26,879	$17,919	**$223,988**	$11,199	$13,439	$13,439	**$262,065**	$52,413	$0
3	116-C-1	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	1,976	Crew Hr	$232	$457,994	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$45,799	$503,794	$75,569	$50,379	**$629,742**	$0	**$629,742**	$94,461	$62,974	**$787,178**	$39,359	$47,231	$47,231	**$920,998**	$184,200	$0
3	116-C-1	Backfill	05 OPERATOR GROUP VIII	2194	HR	$70	$153,498	0	0	1	truck drivers		$15,350	$168,848	$25,327	$16,885	**$211,060**	$18,151	**$229,212**	$34,382	$22,921	**$286,514**	$14,326	$17,191	$17,191	**$335,222**	$67,044	$0
3	116-C-1	Backfill	05 OPERATOR GROUP VIII	11521	HR	$70	$805,937	0	0	1	operators for water truck and front end loader		$80,594	$886,530	$132,980	$88,653	**$1,108,163**	$95,302	**$1,203,465**	$180,520	$120,347	**$1,504,331**	$75,217	$90,260	$90,260	**$1,760,068**	$352,014	$0
3	116-C-1	Excavation	118 Fuel - Diesel	594.37	gal	$4	$2,181	0	0	1	Fuel		$218	$2,399	$360	$240	**$2,999**	$258	**$3,257**	$489	$326	**$4,072**	$204	$244	$244	**$4,764**	$953	$0
3	116-C-1	Excavation	119 Fuel Delivery	594.37	gal	$2	$1,064	0	0	1	Fuel Delivery		$106	$1,170	$176	$117	**$1,463**	$126	**$1,589**	$238	$159	**$1,986**	$99	$119	$119	**$2,323**	$465	$0
-		**Excavation - site 118-B-1**																										
4	118-B-1 (burial grd)	Excavation	111 Excavation Crew (#43) Contaminated	2,015	Crew Hr	$1,223	$2,464,245	0	0	1	excavation during contaminated areas based on cy/60hrs		$246,425	$2,710,670	$406,600	$271,067	**$3,388,337**	$291,397	**$3,679,734**	$551,960	$367,973	**$4,599,668**	$229,983	$275,980	$275,980	**$5,381,611**	$1,076,322	$0
4	118-B-1 (burial grd)	Excavation	110 Excavation Crew (#42) Un-contaminated	1,717	Crew Hr	$904	$1,551,832	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$155,183	$1,707,015	$256,052	$170,702	**$2,133,769**	$183,504	**$2,317,273**	$347,591	$231,727	**$2,896,592**	$144,830	$173,796	$173,796	**$3,389,012**	$677,802	$0
4	118-B-1 (burial grd)	Excavation	114 Excavator (Contaminated)	13	MO	$5,200	$65,474	0	0	1	excavator time based on crew time for excavating contaminated soil		$6,547	$72,022	$10,803	$7,202	**$90,027**	$7,742	**$97,769**	$14,665	$9,777	**$122,212**	$6,111	$7,333	$7,333	**$142,988**	$28,598	$0
4	118-B-1 (burial grd)	Excavation	113 Excavator (Un-contaminated)	11	MO	$5,200	$55,793	0	0	1	excavator time based on crew time for excavating non contaminated soil		$5,579	$61,372	$9,206	$6,137	**$76,715**	$6,597	**$83,312**	$12,497	$8,331	**$104,141**	$5,207	$6,248	$6,248	**$121,844**	$24,369	$0
4	118-B-1 (burial grd)	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	8	EA	$165	$1,396	0	0	1	analytical during excavaion to verify clean based on SF/6724		$140	$1,535	$230	$154	**$1,919**	$165	**$2,084**	$313	$208	**$2,605**	$130	$156	$156	**$3,048**	$610	$0
-		**ERDF Disposal & Backfill - site 118-B-1**																										
4	118-B-1 (burial grd)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	107	EA	$497	$53,015	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification		$5,302	$58,317	$8,748	$5,832	**$72,896**	$6,269	**$79,165**	$11,875	$7,917	**$98,957**	$4,948	$5,937	$5,937	**$115,779**	$23,156	$0
4	118-B-1 (burial grd)	ERDF Disposal	811 ERDF WG	120,875	Ton	$83	$10,032,661	0	0	1	CY of contaminated soild going to ERDF	10,667	$1,003,266	$11,035,928	$1,655,389	$1,103,593	**$13,794,909**	$1,186,362	**$14,981,272**	$2,247,191	$1,498,127	**$18,726,590**	$936,329	$1,123,595	$1,123,595	**$21,910,110**	$4,382,022	$0
4	118-B-1 (burial grd)	Backfill	133 Backfill and soil cover crew (#46)	2,266	Crew Hr	$1,359	$3,080,254	0	0	1	backfill crew based on cy/185		$308,025	$3,388,280	$508,242	$338,828	**$4,235,349**	$364,240	**$4,599,590**	$689,938	$459,959	**$5,749,487**	$287,474	$344,969	$344,969	**$6,726,900**	$1,345,380	$0
4	118-B-1 (burial grd)	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
4	118-B-1 (burial grd)	Backfill	112 DumpTrucks	14	MO	$6,200	$87,805	0	0	1	Trucks from borrow pit		$8,780	$96,585	$14,488	$9,659	**$120,731**	$10,383	**$131,114**	$19,667	$13,111	**$163,893**	$8,195	$9,834	$9,834	**$191,755**	$38,351	$0
4	118-B-1 (burial grd)	Backfill	134 Front End Loader	37	MO	$15,500	$580,980	0	0	1	front end loader to deliver and sprad backfill soil		$58,098	$639,078	$95,862	$63,908	**$798,848**	$68,701	**$867,549**	$130,132	$86,755	**$1,084,436**	$54,222	$65,066	$65,066	**$1,268,790**	$253,758	$0
4	118-B-1 (burial grd)	Backfill	137 Water Truck	37	MO	$6,200	$232,392	0	0	1	water truck		$23,239	$255,631	$38,345	$25,563	**$319,539**	$27,480	**$347,019**	$52,053	$34,702	**$433,774**	$21,689	$26,026	$26,026	**$507,516**	$101,503	$0
4	118-B-1 (burial grd)	Backfill	139 Revegetate area	6	Ac	$5,010	$31,876	0	0	1	revegetate area		$3,188	$35,063	$5,260	$3,506	**$43,829**	$3,769	**$47,599**	$7,140	$4,760	**$59,498**	$2,975	$3,570	$3,570	**$69,613**	$13,923	$0
4	118-B-1 (burial grd)	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$120,000	0	0	1	survey tent $120000 (allowance)		$12,000	$132,000	$19,800	$13,200	**$165,000**	$14,190	**$179,190**	$26,879	$17,919	**$223,988**	$11,199	$13,439	$13,439	**$262,065**	$52,413	$0
4	118-B-1 (burial grd)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	2,133	Crew Hr	$232	$494,526	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$49,453	$543,979	$81,597	$54,398	**$679,973**	$0	**$679,973**	$101,996	$67,997	**$849,967**	$42,498	$50,998	$50,998	**$994,461**	$198,892	$0
4	118-B-1 (burial grd)	Backfill	05 OPERATOR GROUP VIII	2266	HR	$70	$158,510	0	0	1	truck drivers		$15,851	$174,361	$26,154	$17,436	**$217,951**	$18,744	**$236,695**	$35,504	$23,669	**$295,868**	$14,793	$17,752	$17,752	**$346,166**	$69,233	$0
4	118-B-1 (burial grd)	Backfill	05 OPERATOR GROUP VIII	11994	HR	$70	$839,054	0	0	1	operators for water truck and front end loader		$83,905	$922,960	$138,444	$92,296	**$1,153,700**	$99,218	**$1,252,918**	$187,938	$125,292	**$1,566,147**	$78,307	$93,969	$93,969	**$1,832,392**	$366,478	$0
4	118-B-1 (burial grd)	Excavation	118 Fuel - Diesel	622	gal	$4	$2,282	0	0	1	fuel		$228	$2,511	$377	$251	**$3,138**	$270	**$3,408**	$511	$341	**$4,260**	$213	$256	$256	**$4,984**	$997	$0
4	118-B-1 (burial grd)	Excavation	119 Fuel Delivery	622	gal	$2	$1,113	0	0	1	Fuel Delivery		$111	$1,224	$184	$122	**$1,531**	$132	**$1,662**	$249	$166	**$2,078**	$104	$125	$125	**$2,431**	$486	$0
-		**Excavation - site 118-B-8:4**																										
5	118-B-8:4	Excavation	111 Excavation Crew (#43) Contaminated	15	Crew Hr	$1,223	$18,287	0	0	1	excavation during contaminated areas based on cy/60hrs		$1,829	$20,115	$3,017	$2,012	**$25,144**	$2,162	**$27,307**	$4,096	$2,731	**$34,133**	$1,707	$2,048	$2,048	**$39,936**	$7,987	$0
5	118-B-8:4	Excavation	110 Excavation Crew (#42) Un-contaminated	128	Crew Hr	$904	$115,639	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$11,564	$127,203	$19,080	$12,720	**$159,004**	$13,674	**$172,678**	$25,902	$17,268	**$215,848**	$10,792	$12,951	$12,951	**$252,542**	$50,508	$0
5	118-B-8:4	Excavation	114 Excavator (Contaminated)	1	MO	$5,200	$5,200	0	0	1	excavator time based on crew time for excavating contaminated soil		$520	$5,720	$858	$572	**$7,150**	$615	**$7,765**	$1,165	$776	**$9,706**	$485	$582	$582	**$11,356**	$2,271	$0
5	118-B-8:4	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$4,158	0	0	1	excavator time based on crew time for excavating non contaminated soil		$416	$4,573	$686	$457	**$5,717**	$492	**$6,208**	$931	$621	**$7,760**	$388	$466	$466	**$9,080**	$1,816	$0
5	118-B-8:4	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analytical during excavaion to verify clean based on SF/6724		$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**ERDF Disposal & Backfill - site 118-B-8:4**																										
5	118-B-8:4	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	90	$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
5	118-B-8:4	ERDF Disposal	811 ERDF WG	1166	Ton	$83	$96,785	0	0	1	CY of contaminated soild going to ERDF		$9,679	$106,464	$15,970	$10,646	**$133,080**	$11,445	**$144,525**	$21,679	$14,452	**$180,656**	$9,033	$10,839	$10,839	**$211,368**	$42,274	$0
5	118-B-8:4	Backfill	133 Backfill and soil cover crew (#46)	115	Crew Hr	$1,359	$156,990	0	0	1	backfill crew based on cy/185		$15,699	$172,689	$25,903	$17,269	**$215,861**	$18,564	**$234,425**	$35,164	$23,442	**$293,031**	$14,652	$17,582	$17,582	**$342,847**	$68,569	$0
5	118-B-8:4	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	112 DumpTrucks	2	MO	$6,200	$10,011	0	0	1	Trucks from borrow pit		$1,001	$11,013	$1,652	$1,101	**$13,766**	$1,184	**$14,950**	$2,242	$1,495	**$18,687**	$934	$1,121	$1,121	**$21,864**	$4,373	$0
5	118-B-8:4	Backfill	134 Front End Loader	2	MO	$15,500	$25,029	0	0	1	front end loader to deliver and sprad backfill soil		$2,503	$27,532	$4,130	$2,753	**$34,414**	$2,960	**$37,374**	$5,606	$3,737	**$46,718**	$2,336	$2,803	$2,803	**$54,660**	$10,932	$0
5	118-B-8:4	Backfill	137 Water Truck	2	MO	$6,200	$10,011	0	0	1	water truck		$1,001	$11,013	$1,652	$1,101	**$13,766**	$1,184	**$14,950**	$2,242	$1,495	**$18,687**	$934	$1,121	$1,121	**$21,864**	$4,373	$0
5	118-B-8:4	Backfill	139 Revegetate area	0	Ac	$5,010	$2,412	0	0	1	revegetate area		$241	$2,653	$398	$265	**$3,317**	$285	**$3,602**	$540	$360	**$4,502**	$225	$270	$270	**$5,268**	$1,054	$0
5	118-B-8:4						$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	18	Crew Hr	$232	$4,158	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$416	$4,574	$686	$457	**$5,718**	$0	**$5,718**	$858	$572	**$7,147**	$357	$429	$429	**$8,362**	$1,672	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	115	HR	$70	$8,079	0	0	1	truck drivers		$808	$8,887	$1,333	$889	**$11,108**	$955	**$12,064**	$1,810	$1,206	**$15,079**	$754	$905	$905	**$17,643**	$3,529	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	517	HR	$70	$36,147	0	0	1	operators for water truck and front end loader		$3,615	$39,761	$5,964	$3,976	**$49,702**	$4,274	**$53,976**	$8,096	$5,398	**$67,470**	$3,373	$4,048	$4,048	**$78,940**	$15,788	$0
5	118-B-8:4	Excavation	118 Fuel - Diesel	24	gal	$4	$87	0	0	1	fuel		$9	$96	$14	$10	**$120**	$10	**$130**	$20	$13	**$163**	$8	$10	$10	**$191**	$38	$0
5	118-B-8:4	Excavation	119 Fuel Delivery	24	gal	$2	$43	0	0	1	Fuel Delivery		$4	$47	$7	$5	**$59**	$5	**$64**	$10	$6	**$80**	$4	$5	$5	**$93**	$19	$0

-		**Excavation - site 116-B-6A**																									
7	116-B-6A/116-B-16 Tank	Excavation	111 Excavation Crew (#43) Contaminated	40	Crew Hr	$1,223	$49,254	0	0	1	excavation during contaminated areas based on cy/60hrs		$4,925	$54,180	$8,127	$5,418	**$67,724**	$5,824	**$73,549**	$11,032	$7,355	**$91,936**	$4,597	$5,516	$5,516	**$107,565**	$21,513	$0
7	116-B-6A/116-B-16 Tank	Excavation	110 Excavation Crew (#42) Un-contaminated	218	Crew Hr	$904	$196,816	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$19,682	$216,498	$32,475	$21,650	**$270,622**	$23,274	**$293,896**	$44,084	$29,390	**$367,370**	$18,368	$22,042	$22,042	**$429,822**	$85,964	$0
7	116-B-6A/116-B-16 Tank	Excavation	114 Excavator (Contaminated)	1	MO	$5,200	$5,200	0	0	1	excavator time based on crew time for excavating contaminated soil		$520	$5,720	$858	$572	**$7,150**	$615	**$7,765**	$1,165	$776	**$9,706**	$485	$582	$582	**$11,356**	$2,271	$0
7	116-B-6A/116-B-16 Tank	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$7,076	0	0	1	excavator time based on crew time for excavating non contaminated soil		$708	$7,784	$1,168	$778	**$9,730**	$837	**$10,566**	$1,585	$1,057	**$13,208**	$660	$792	$792	**$15,453**	$3,091	$0
7	116-B-6A/116-B-16 Tank	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analytical during excavaion to verify clean based on SF/6724		$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**ERDF Disposal & Backfill - site 116-B-6A**																									
7	116-B-6A/116-B-16 Tank	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	2	EA	$497	$897	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	181	$90	$987	$148	$99	**$1,234**	$106	**$1,340**	$201	$134	**$1,675**	$84	$100	$100	**$1,959**	$392	$0
7	116-B-6A/116-B-16 Tank	ERDF Disposal	811 ERDF WG	2347	Ton	$83	$194,785	0	0	1	CY of contaminated soild going to ERDF		$19,479	$214,264	$32,140	$21,426	**$267,830**	$23,033	**$290,863**	$43,629	$29,086	**$363,579**	$18,179	$21,815	$21,815	**$425,387**	$85,077	$0
7	116-B-6A/116-B-16 Tank	Backfill	133 Backfill and soil cover crew (#46)	257	Crew Hr	$1,359	$350,013	0	0	1	backfill crew based on cy/185		$35,001	$385,014	$57,752	$38,501	**$481,268**	$41,389	**$522,657**	$78,399	$52,266	**$653,321**	$32,666	$39,199	$39,199	**$764,386**	$152,877	$0
7	116-B-6A/116-B-16 Tank	Backfill	112 DumpTrucks	3	MO	$6,200	$19,975	0	0	1	Trucks from borrow pit		$1,997	$21,972	$3,296	$2,197	**$27,465**	$2,362	**$29,827**	$4,474	$2,983	**$37,284**	$1,864	$2,237	$2,237	**$43,622**	$8,724	$0
7	116-B-6A/116-B-16 Tank	Backfill	134 Front End Loader	3	MO	$15,500	$49,936	0	0	1	front end loader to deliver and sprad backfill soil		$4,994	$54,930	$8,240	$5,493	**$68,663**	$5,905	**$74,568**	$11,185	$7,457	**$93,209**	$4,660	$5,593	$5,593	**$109,055**	$21,811	$0
7	116-B-6A/116-B-16 Tank	Backfill	137 Water Truck	3	MO	$6,200	$19,975	0	0	1	water truck		$1,997	$21,972	$3,296	$2,197	**$27,465**	$2,362	**$29,827**	$4,474	$2,983	**$37,284**	$1,864	$2,237	$2,237	**$43,622**	$8,724	$0
7	116-B-6A/116-B-16 Tank	Backfill	139 Revegetate area	1	Ac	$5,010	$6,742	0	0	1	revegetate area		$674	$7,416	$1,112	$742	**$9,270**	$797	**$10,068**	$1,510	$1,007	**$12,585**	$629	$755	$755	**$14,724**	$2,945	$0
7	116-B-6A/116-B-16 Tank	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	36	Crew Hr	$232	$8,369	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$837	$9,206	$1,381	$921	**$11,507**	$0	**$11,507**	$1,726	$1,151	**$14,384**	$719	$863	$863	**$16,830**	$3,366	$0
7	116-B-6A/116-B-16 Tank	Backfill	05 OPERATOR GROUP VIII	257	HR	$70	$18,012	0	0	1	truck drivers		$1,801	$19,813	$2,972	$1,981	**$24,766**	$2,130	**$26,896**	$4,034	$2,690	**$33,620**	$1,681	$2,017	$2,017	**$39,335**	$7,867	$0
7	116-B-6A/116-B-16 Tank	Backfill	05 OPERATOR GROUP VIII	1031	HR	$70	$72,118	0	0	1	operators for water truck and front end loader		$7,212	$79,330	$11,900	$7,933	**$99,163**	$8,528	**$107,691**	$16,154	$10,769	**$134,613**	$6,731	$8,077	$8,077	**$157,498**	$31,500	$0
7	116-B-6A/116-B-16 Tank	Excavation	118 Fuel - Diesel	43	gal	$4	$158	0	0	1	fuel		$16	$174	$26	$17	**$217**	$19	**$236**	$35	$24	**$295**	$15	$18	$18	**$345**	$69	$0
7	116-B-6A/116-B-16 Tank	Excavation	119 Fuel Delivery	43	gal	$2	$77	0	0	1	Fuel Delivery		$8	$85	$13	$8	**$106**	$9	**$115**	$17	$11	**$144**	$7	$9	$9	**$168**	$34	$0
-		**Install new monitoring wells**																									
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	600	LF	$546	$327,600	0	0	1	Phase I: 6 new wells = (new monitoring wells)		$32,760	$360,360	$54,054	$36,036	**$450,450**	$38,739	**$489,189**	$73,378	$48,919	**$611,486**	$30,574	$36,689	$36,689	**$715,438**	$143,088	$0
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	400	LF	$546	$218,400	6	6	1	Phase II: 4 new wells (new monitoring wells) - after 5 years		$21,840	$240,240	$36,036	$24,024	**$300,300**	$25,826	**$326,126**	$48,919	$32,613	**$407,657**	$20,383	$24,459	$24,459	**$476,959**	$95,392	$0
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	60	HR	$103	$6,185	0	0	1	assume 10 ft per hour based on number of linear feet		$619	$6,804	$1,021	$680	**$8,505**	$731	**$9,236**	$1,385	$924	**$11,545**	$577	$693	$693	**$13,508**	$2,702	$0
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	40	HR	$103	$4,124	6	6	1	assume 10 ft per hour based on number of linear feet		$412	$4,536	$680	$454	**$5,670**	$488	**$6,158**	$924	$616	**$7,697**	$385	$462	$462	**$9,005**	$1,801	$0
8	Groundwater	well drilling	295 Dispose of drill cuttings	44	ton	$83	$3,625	0	0	1	6 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy		$363	$3,988	$598	$399	**$4,985**	$429	**$5,414**	$812	$541	**$6,767**	$338	$406	$406	**$7,918**	$1,584	$0
8	Groundwater	well drilling	295 Dispose of drill cuttings	29	ton	$83	$2,417	6	6	1	4 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy		$242	$2,659	$399	$266	**$3,323**	$286	**$3,609**	$541	$361	**$4,511**	$226	$271	$271	**$5,278**	$1,056	$0
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well		$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**	$1,260	$1,512	$1,512	**$29,482**	$5,896	$0
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	6000	LF	$2	$9,000	6	6	1	4 wells, assumed 1,500 LF of power cable for each well		$900	$9,900	$1,485	$990	**$12,375**	$1,064	**$13,439**	$2,016	$1,344	**$16,799**	$840	$1,008	$1,008	**$19,655**	$3,931	$0
-		**Expansion of 100-KW P&T System**																									
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	1	LS	$1,593,940	$1,593,940	0	0	1	cost of expanding the 100KX treatment facility to accommodate the 100-BC-5 Cr & Sr treatment		$159,394	$1,753,334	$263,000	$175,333	**$2,191,668**	$0	**$2,191,668**	$328,750	$219,167	**$2,739,584**	$136,979	$164,375	$164,375	**$3,205,314**	$641,063	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	1	LS	$2,343,434	$2,343,434	0	0	1	cost of expanding the 100KX treatment facility to accommodate the 100-BC-5 Cr & Sr treatment		$234,343	$2,577,777	$386,667	$257,778	**$3,222,222**	$277,111	**$3,499,333**	$524,900	$349,933	**$4,374,166**	$218,708	$262,450	$262,450	**$5,117,774**	$1,023,555	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$3	$0	0	0	1	3" HDPE Transfer Piping, ft (extraction)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	0	LF	$11	$0	0	0	1	8" HDPE Transfer Piping, ft (extraction)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	1050 Pipe Fusion Crew (includes testing)	0	team hr	$907	$0	0	0	1	pipe fusion crew to connect pipe lengths, test and place in trench (extraction)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	30 McElroy Fusion Machine	0	WK	$225	$0	0	0	1	Weekly rental of fusion machine for fusing pipelines. Using the pipeline fusion crew for time for use of fusion machine (extraction)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	110 Excavation Crew (#42) Un-contaminated	0	Crew Hr	$904	$0	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (extraction)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	100 Project Management Crew	0	Crew Hr	$386	$0	0	0	1	Project management at half time during excavation & pipe fusion (extraction)		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	17 Freight for HDPE Pipe	0	trip	$2,500	$0	0	0	1	frieght for pipe for extraction wells, 20 foot length with 54 pipes per load		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0

-		**Extraction wells & equipment**																							
8	Groundwater	Extraction Wells	253 Extraction well(s)	900	LF	$535	$481,500	0	0	1	5 shallow (100') + 2 deep (200') (total of 7) - 8" diameter extraction wells	$48,150	$529,650	$79,448	$52,965	**$662,063**	$56,937	**$719,000**	$107,850	$71,900	**$898,750**	$44,937	$53,925	$53,925	**$1,051,537**	$210,307	$0
8	Groundwater	Extraction Wells	275 Pump Assembly	7	EA	$3,200	$22,400	0	0	1	7 pumps for 7 extraction wells	$2,240	$24,640	$3,696	$2,464	**$30,800**	$2,649	**$33,449**	$5,017	$3,345	**$41,811**	$2,091	$2,509	$2,509	**$48,919**	$9,784	$0
8	Groundwater	Extraction Wells	289 Landing Plate	7	EA	$350	$2,450	0	0	1	7 landing plates for 7 extraction wells	$245	$2,695	$404	$270	**$3,369**	$290	**$3,658**	$549	$366	**$4,573**	$229	$274	$274	**$5,351**	$1,070	$0
8	Groundwater	Extraction Wells	271 Riser Pipe	900	LF	$50	$44,586	0	0	1	riser pipe for each well	$4,459	$49,045	$7,357	$4,904	**$61,306**	$5,272	**$66,578**	$9,987	$6,658	**$83,223**	$4,161	$4,993	$4,993	**$97,370**	$19,474	$0
8	Groundwater	Extraction Wells	279 Disconnect Boxes	7	EA	$400	$2,800	0	0	1	7 disconnect boxes for 7 extraction wells	$280	$3,080	$462	$308	**$3,850**	$331	**$4,181**	$627	$418	**$5,226**	$261	$314	$314	**$6,115**	$1,223	$0
8	Groundwater	Extraction Wells	280 Allowance for Electrical Hookups	1	EA	$228	$228	0	0	1	1 allowance for electrical hookups for the 7 extraction wells	$23	$251	$38	$25	**$314**	$27	**$340**	$51	$34	**$426**	$21	$26	$26	**$498**	$100	$0
8	Groundwater	Extraction Wells	266 #10/4C THHN (tray cable)	900	LF	$2	$1,368	0	0	1	200 LF x 7wells	$137	$1,505	$226	$150	**$1,881**	$162	**$2,043**	$306	$204	**$2,553**	$128	$153	$153	**$2,988**	$598	$0
8	Groundwater	Extraction Wells	285 Pump Setting Crew	70	Team/Hr	$529	$37,004	0	0	1	1 - 10 hour days per well x 7 wells	$3,700	$40,705	$6,106	$4,070	**$50,881**	$4,376	**$55,257**	$8,289	$5,526	**$69,071**	$3,454	$4,144	$4,144	**$80,813**	$16,163	$0
8	Groundwater	Extraction Wells	284 Extraction rack	7	EA	$150,000	$1,050,000	0	0	1	1 extraction well rack per well x 7 wells	$105,000	$1,155,000	$173,250	$115,500	**$1,443,750**	$124,163	**$1,567,913**	$235,187	$156,791	**$1,959,891**	$97,995	$117,593	$117,593	**$2,293,072**	$458,614	$0
8	Groundwater	Extraction Wells	10 Drilling Mobilization, completion, cleanup and demob	7	per well	$36,250	$253,750	0	0	1	drilling mob/demob etc per well x 7 wells	$25,375	$279,125	$41,869	$27,913	**$348,906**	$30,006	**$378,912**	$56,837	$37,891	**$473,640**	$23,682	$28,418	$28,418	**$554,159**	$110,832	$0
8	Groundwater	Extraction Wells	268 Water Level Sensor	7	EA	$1,200	$8,400	0	0	1	7 wells x 1 water level sensor	$840	$9,240	$1,386	$924	**$11,550**	$993	**$12,543**	$1,881	$1,254	**$15,679**	$784	$941	$941	**$18,345**	$3,669	$0
8	Groundwater	Extraction Wells	291 10000 Gallon Norwesco Plastic Potable Water Storage Tank	1	EA	$5,870	$5,870	0	0	1	1 - Influent collection tank, 10,000 gallons	$587	$6,457	$969	$646	**$8,071**	$694	**$8,765**	$1,315	$877	**$10,957**	$548	$657	$657	**$12,819**	$2,564	$0
8	Groundwater	Extraction Wells	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	5000	LF	$3	$16,400	0	0	1	3" HDPE Transfer Piping, ft	$1,640	$18,040	$2,706	$1,804	**$22,550**	$1,939	**$24,489**	$3,673	$2,449	**$30,612**	$1,531	$1,837	$1,837	**$35,816**	$7,163	$0
8	Groundwater	Extraction Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPE Transfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Extraction Wells	1050 Pipe Fusion Crew (includes testing)	250	team hr	$907	$226,814	0	0	1	cost for fusion crew working on injection wells	$22,681	$249,496	$37,424	$24,950	**$311,870**	$26,821	**$338,690**	$50,804	$33,869	**$423,363**	$21,168	$25,402	$25,402	**$495,335**	$99,067	$0
8	Groundwater	Extraction Wells	30 McElroy Fusion Machine	6	WK	$225	$1,406	0	0	1	Pipe fusion machine	$141	$1,547	$232	$155	**$1,934**	$166	**$2,100**	$315	$210	**$2,625**	$131	$157	$157	**$3,071**	$614	$0
8	Groundwater	Extraction Wells	110 Excavation Crew (#42) Un-contaminated	250	Crew Hr	$904	$225,991	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$22,599	$248,590	$37,288	$24,859	**$310,737**	$26,723	**$337,461**	$50,619	$33,746	**$421,826**	$21,091	$25,310	$25,310	**$493,536**	$98,707	$0
8	Groundwater	Extraction Wells	100 Project Management Crew	125	Crew Hr	$386	$48,295	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,829	$53,124	$7,969	$5,312	**$66,405**	$5,711	**$72,116**	$10,817	$7,212	**$90,145**	$4,507	$5,409	$5,409	**$105,469**	$21,094	$0
8	Groundwater	Extraction Wells	17 Freight for HDPE Pipe	14	trip	$2,500	$34,722	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,472	$38,194	$5,729	$3,819	**$47,743**	$4,106	**$51,849**	$7,777	$5,185	**$64,811**	$3,241	$3,889	$3,889	**$75,829**	$15,166	$0
8	Groundwater	Extraction Wells	260 Fiber-optic cable and interfaces	10000	FT	$1	$13,300	0	0	1	Fiber Optic Cable	$1,330	$14,630	$2,195	$1,463	**$18,288**	$1,573	**$19,860**	$2,979	$1,986	**$24,825**	$1,241	$1,490	$1,490	**$29,046**	$5,809	$0
8	Groundwater	Extraction Wells	265 Transfer Station (extraction station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Extraction Wells	293 Fiber Optic Splice Box	4	EA	$1,000	$4,000	0	0	1	splice box every 2,500 running feet of fiber cable	$400	$4,400	$660	$440	**$5,500**	$473	**$5,973**	$896	$597	**$7,466**	$373	$448	$448	**$8,736**	$1,747	$0
8	Groundwater	Extraction Wells	294 Geologists/Geophysicists/Hydro - S030	90	HR	$103	$9,278	0	0	1	assume 10 ft per hour based on number of linear feet	$928	$10,206	$1,531	$1,021	**$12,757**	$1,097	**$13,855**	$2,078	$1,385	**$17,318**	$866	$1,039	$1,039	**$20,262**	$4,052	$0
8	Groundwater	Extraction Wells	50 Globe Valve 3"	7	EA	$1,280	$8,959	0	0	1	1 ball valve per well x 7 wells	$896	$9,854	$1,478	$985	**$12,318**	$1,059	**$13,377**	$2,007	$1,338	**$16,722**	$836	$1,003	$1,003	**$19,564**	$3,913	$0
8	Groundwater	Extraction Wells	51 Cable, 4/C #2 Type W	10500	LF	$2	$15,750	0	0	1	7 wells, assumed 1,500 LF of power cable for each well	$1,575	$17,325	$2,599	$1,733	**$21,656**	$1,862	**$23,519**	$3,528	$2,352	**$29,398**	$1,470	$1,764	$1,764	**$34,396**	$6,879	$0
8	Groundwater	Extraction Wells	295 Dispose of drill cuttings	67	ton	$83	$5,590	0	0	1	5 shallow (100')(5.1611 cy x 4) + 2 deep (200')(10.322cy x 2) (total of 6 wells) - 8" diameter extraction wells. 2,900 lbs/cy	$559	$6,149	$922	$615	**$7,687**	$661	**$8,348**	$1,252	$835	**$10,434**	$522	$626	$626	**$12,208**	$2,442	$0
-		**4 new injection wells & equipment & associated Piping**																									
8	Groundwater	Injection Wells	292 SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size (*3.97" I.D.) x **20 ft., †MAX PSI 100 @ 73 Deg. F (PRICE IS PER FOOT. ONLY SOLD IN 20 FT. LENGTHS)	4000	LF	$3	$13,120	0	0	1	4" HDPE Transfer Piping, ft	$1,312	$14,432	$2,165	$1,443	**$18,040**	$1,551	**$19,591**	$2,939	$1,959	**$24,489**	$1,224	$1,469	$1,469	**$28,652**	$5,730	$0
8	Groundwater	Injection Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPETransfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Injection Wells	1050 Pipe Fusion Crew (includes testing)	240	team hr	$907	$217,742	0	0	1	cost for fusion crew working on injection wells	$21,774	$239,516	$35,927	$23,952	**$299,395**	$25,748	**$325,143**	$48,771	$32,514	**$406,428**	$20,321	$24,386	$24,386	**$475,521**	$95,104	$0
8	Groundwater	Injection Wells	30 McElroy Fusion Machine	6	WK	$225	$1,350	0	0	1	Pipe fusion machine	$135	$1,485	$223	$149	**$1,856**	$160	**$2,016**	$302	$202	**$2,520**	$126	$151	$151	**$2,948**	$590	$0
8	Groundwater	Injection Wells	110 Excavation Crew (#42) Un-contaminated	240	Crew Hr	$904	$216,951	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$21,695	$238,646	$35,797	$23,865	**$298,308**	$25,654	**$323,962**	$48,594	$32,396	**$404,953**	$20,248	$24,297	$24,297	**$473,795**	$94,759	$0
8	Groundwater	Injection Wells	100 Project Management Crew	120	Crew Hr	$386	$46,363	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,636	$50,999	$7,650	$5,100	**$63,749**	$5,482	**$69,231**	$10,385	$6,923	**$86,539**	$4,327	$5,192	$5,192	**$101,251**	$20,250	$0
8	Groundwater	Injection Wells	17 Freight for HDPE Pipe	13	trip	$2,500	$32,407	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,241	$35,648	$5,347	$3,565	**$44,560**	$3,832	**$48,392**	$7,259	$4,839	**$60,490**	$3,025	$3,629	$3,629	**$70,774**	$14,155	$0
8	Groundwater	Injection Wells	254 Injection Well(s)	800	LF	$535	$428,000	0	0	1	4 injection wells drilled down to 200 LF	$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**	$39,944	$47,933	$47,933	**$934,700**	$186,940	$0
8	Groundwater	Injection Wells	264 Transfer Station (injection station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Injection Wells	289 Landing Plate	4	EA	$350	$1,400	0	0	1	4 landing plates, 1 for each injection well	$140	$1,540	$231	$154	**$1,925**	$166	**$2,091**	$314	$209	**$2,613**	$131	$157	$157	**$3,057**	$611	$0
8	Groundwater	Injection Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	200 LF x 4 injection wells	$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**	$3,699	$4,439	$4,439	**$86,551**	$17,310	$0
8	Groundwater	Injection Wells	285 Pump Setting Crew	40	Team/Hr	$529	$21,145	0	0	1	10 hours per well x 4 wells for injection wells (using pump setting crew to cost installation of injection racks)	$2,115	$23,260	$3,489	$2,326	**$29,075**	$2,500	**$31,575**	$4,736	$3,158	**$39,469**	$1,973	$2,368	$2,368	**$46,179**	$9,236	$0
8	Groundwater	Injection Wells	283 Injection Rack	4	EA	$40,000	$160,000	0	0	1	1 injection rack per injection well x 4 wells	$16,000	$176,000	$26,400	$17,600	**$220,000**	$18,920	**$238,920**	$35,838	$23,892	**$298,650**	$14,933	$17,919	$17,919	**$349,421**	$69,884	$0
8	Groundwater	Injection Wells	10 Drilling Mobilization, completion, cleanup and demob	4	per well	$36,250	$145,000	0	0	1	4 wells x mob/demob of crew	$14,500	$159,500	$23,925	$15,950	**$199,375**	$17,146	**$216,521**	$32,478	$21,652	**$270,652**	$13,533	$16,239	$16,239	**$316,662**	$63,332	$0
8	Groundwater	Injection Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	assume 10 ft per hour based on number of linear feet	$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**	$770	$924	$924	**$18,011**	$3,602	$0
8	Groundwater	Injection Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	4 deep (200')(10.322cy x 4) - 8" diameter extraction wells. 2,900 lbs/cy	$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**	$464	$556	$556	**$10,852**	$2,170	$0

-		**Excavation - Site 100-B-34 (Sewer Line) - equipment continued**																									
1	100-B-34 (Radioactive Process sewer)	Backfill	112 DumpTrucks	1	MO	$6,200	$5,989	0	0	1	Trucks from borrow pit	$599	$6,588	$988	$659	**$8,235**	$708	**$8,943**	$1,341	$894	**$11,179**	$559	$671	$671	**$13,079**	$2,616	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	134 Front End Loader	1	MO	$15,500	$14,972	0	0	1	front end loader to deliver and spread backfill soil	$1,497	$16,470	$2,470	$1,647	**$20,587**	$1,770	**$22,358**	$3,354	$2,236	**$27,947**	$1,397	$1,677	$1,677	**$32,698**	$6,540	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	137 Water Truck	1	MO	$6,200	$5,989	0	0	1	water truck (entire length of project)	$599	$6,588	$988	$659	**$8,235**	$708	**$8,943**	$1,341	$894	**$11,179**	$559	$671	$671	**$13,079**	$2,616	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	139 Revegetate area	1	Ac	$5,010	$3,571	0	0	1	revegetate area	$357	$3,928	$589	$393	**$4,910**	$422	**$5,332**	$800	$533	**$6,665**	$333	$400	$400	**$7,798**	$1,560	$0
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$78,000	0	0	1	survey tent $120000 (allowance)	$7,800	$85,800	$12,870	$8,580	**$107,250**	$9,224	**$116,474**	$17,471	$11,647	**$145,592**	$7,280	$8,736	$8,736	**$170,342**	$34,068	$0
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	2	Crew Hr	$232	$444	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.	$44	$489	$73	$49	**$611**	$0	**$611**	$92	$61	**$764**	$38	$46	$46	**$893**	$179	$0
-		**Insitu Reduction (ISR) for Chromium**																									
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	507 Mobilize & Reburbish Skids	1	LS	$34,891	$34,891	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$3,489	$38,380	$5,757	$3,838	**$47,975**	$4,126	**$52,101**	$7,815	$5,210	**$65,126**	$3,256	$3,908	$3,908	**$76,197**	$15,239	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	508 Sampling Support	1	LS	$105,243	$105,243	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$10,524	$115,768	$17,365	$11,577	**$144,709**	$12,445	**$157,154**	$23,573	$15,715	**$196,443**	$9,822	$11,787	$11,787	**$229,838**	$45,968	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	509 Install Injection System and Inject	1	LS	$255,299	$255,299	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$25,530	$280,829	$42,124	$28,083	**$351,036**	$30,189	**$381,225**	$57,184	$38,123	**$476,531**	$23,827	$28,592	$28,592	**$557,542**	$111,508	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	510 Demobilize	1	LS	$24,336	$24,336	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$2,434	$26,770	$4,015	$2,677	**$33,462**	$2,878	**$36,340**	$5,451	$3,634	**$45,425**	$2,271	$2,725	$2,725	**$53,147**	$10,629	$0
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	511 Drilling	1	LS	$218,780	$218,780	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$21,878	$240,658	$36,099	$24,066	**$300,823**	$25,871	**$326,693**	$49,004	$32,669	**$408,367**	$20,418	$24,502	$24,502	**$477,789**	$95,558	$0
-		**Excavation - Site 100-B-34 (Dichromate Transfer Line) - continued**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	05 OPERATOR GROUP VIII	92	HR	$70	$6,420	0	0	1		$642	$7,062	$1,059	$706	**$8,828**	$759	**$9,587**	$1,438	$959	**$11,984**	$599	$719	$719	**$14,021**	$2,804	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	145 Move water main	0	LS	$1,200,000	$420,000	0	0	1		$42,000	$462,000	$69,300	$46,200	**$577,500**	$49,665	**$627,165**	$94,075	$62,717	**$783,956**	$39,198	$47,037	$47,037	**$917,229**	$183,446	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	112 DumpTrucks	1	MO	$6,200	$3,556	0	0	1		$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	134 Front End Loader	1	MO	$15,500	$8,891	0	0	1		$889	$9,780	$1,467	$978	**$12,225**	$1,051	**$13,276**	$1,991	$1,328	**$16,596**	$830	$996	$996	**$19,417**	$3,883	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	137 Water Truck	1	MO	$6,200	$3,556	0	0	1		$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	139 Revegetate area	0	Ac	$5,010	$1,953	0	0	1		$195	$2,148	$322	$215	**$2,685**	$231	**$2,916**	$437	$292	**$3,645**	$182	$219	$219	**$4,264**	$853	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	819 Survey Tent	0	LS	$120,000	$42,000	0	0	1		$4,200	$46,200	$6,930	$4,620	**$57,750**	$4,967	**$62,717**	$9,407	$6,272	**$78,396**	$3,920	$4,704	$4,704	**$91,723**	$18,345	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$69	0	0	1		$7	$76	$11	$8	**$95**	$0	**$95**	$14	$10	**$119**	$6	$7	$7	**$140**	$28	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	120 Fuel Charge	203	Hr	$16	$3,336	0	0	1		$334	$3,669	$550	$367	**$4,587**	$394	**$4,981**	$747	$498	**$6,226**	$311	$374	$374	**$7,285**	$1,457	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
		Expansion of 100-KW P&T System Prior to Startup					$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	0.25	LS	$1,593,940	$398,485	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$39,849	$438,334	$65,750	$43,833	**$547,917**	$0	**$547,917**	$82,188	$54,792	**$684,896**	$34,245	$41,094	$41,094	**$801,328**	$160,266	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	0.25	LS	$2,343,434	$585,859	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$58,586	$644,444	$96,667	$64,444	**$805,555**	$69,278	**$874,833**	$131,225	$87,483	**$1,093,542**	$54,677	$65,612	$65,612	**$1,279,444**	$255,889	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	296 pH Adjustment	1	EA	$610,000	$610,000	0	0	1	Cost for adding pH adjustment capability to 100-KW P&T	$61,000	$671,000	$100,650	$67,100	**$838,750**	$72,133	**$910,883**	$136,632	$91,088	**$1,138,603**	$56,930	$68,316	$68,316	**$1,332,166**	$266,433	$0

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ANNUAL O&M COST												ANNUAL O&M MARKUPS														
SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES	MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Technical Support Services Percent	Technical Support Services Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
-		Institutional Controls & closeout																								
6	116-B-5 (crib)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	5	1	Site visits, 1 per year until 2021, assume MNA monitoring is associated with these site visits (5 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
6	116-B-5 (crib)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	5	5	1	2021 - site closeout	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		MNA & ICs for Groundwater																								
8	Groundwater	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	75	1	Institutional controls for 75 years starting in 2016	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
-		P&T for 15 years																								
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	356 100 KX Pump & Treat Operating Cost	1	per year	$129,523.8095	$129,524	0	15	1	Assumes Cr(VI) < 10 ug/L after 15 Years of Pump and Treat. Assumes 5 years of post-P&T monitoring for Cr(VI).	$0	$129,524	$19,429	$12,952	**$161,905**	$13,924	**$175,829**	$26,374	$17,583	**$219,786**	33%	$72,529	**$292,315**	$58,463	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	355 100KX resin cost	207,360,000	gal	$0.0008	$165,888	0	15	1	resin cost per year, see backup cost tab for more info, "BKUP" (207,360,000 gallons per year is number of gallons at 400gpm)	$0	$165,888	$24,883	$16,589	**$207,360**	$17,833	**$225,193**	$33,779	$22,519	**$281,491**	33%	$92,892	**$374,383**	$74,877	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	400	gpm	$2,187	$874,800	1	15	1	Annual maintenance of P&T system	$0	$874,800	$131,220	$87,480	**$1,093,500**	$94,041	**$1,187,541**	$178,131	$118,754	**$1,484,426**	26%	$385,951	**$1,870,377**	$374,075	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	40	gpm	$2,187	$87,480	1	15	1	Annual cost for pH adjustment	$0	$87,480	$13,122	$8,748	**$109,350**	$9,404	**$118,754**	$17,813	$11,875	**$148,443**	33%	$48,986	**$197,429**	$39,486	$0
-		MNA - sampling first year (existing wells)																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	32	EA	$165	$5,280	1	1	1	annual sampling at 32 existing wells	$0	$5,280	$792	$528	**$6,600**	$568	**$7,168**	$1,075	$717	**$8,960**	45%	$4,032	**$12,991**	$2,598	$0
8	Groundwater	MNA	02 Sampling Crew	64	team/hr	$438	$28,020	1	1	1	annual sampling at 32 existing wells (2 hours per well)	$0	$28,020	$4,203	$2,802	**$35,025**	$3,012	**$38,037**	$5,706	$3,804	**$47,547**	45%	$21,396	**$68,942**	$13,788	$0
-		MNA - sampling 2 - 5 years																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	38	EA	$165	$6,270	2	5	1	annual sampling of 38 wells (new + existing)	$0	$6,270	$941	$627	**$7,838**	$674	**$8,512**	$1,277	$851	**$10,639**	45%	$4,788	**$15,427**	$3,085	$0
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	2	5	1	annual sampling of 38 wells (new + existing) (2 hours per sample)	$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
-		MNA - sampling 6 - 10 years																								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	42	EA	$165	$6,930	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90)	$0	$6,930	$1,040	$693	**$8,663**	$745	**$9,407**	$1,411	$941	**$11,759**	45%	$5,292	**$17,051**	$3,410	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90) (2 hours per well for sampling)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-		MNA - sampling 1 - 5 years (every 5 years)																								
8	Groundwater	MNA	21 Tritium - Low Level (water)	0	EA	$90	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for tritium)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	02 Sampling Crew	0	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	22 VOCs (Chloroform, TCE) water	0.00	EA	$79	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for TCE and chloroform)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	02 Sampling Crew	0.00	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
-		100-B-34 - ICs & closeout (Deep Contamination)					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
1	100-B-34 (Radioactive Process sewer)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	site visits 1 per year, ICs until 2055	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
1	100-B-34 (Radioactive Process sewer)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	Site closeout-final report for radioactive process sewer portion of 100-B-34 in 2055	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		118-B-8:4 - ICs & closeout (Deep Contamination)					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
5	118-B-8:4	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	ICs until year 32021 for deep soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
5	118-B-8:4	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	Closout report at year 32021 of MNA	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		116-B-6A ICs & closeout (Deep Contamination)					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
7	116-B-6A/116-B-16 Tank	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	79	1	Site visits, 1 per year until 2095, assume MNA monitoring is associated with these site visits (79 years).	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	79	79	1	2095 - site closeout	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		MNA - sampling Tritium										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	1	EA	$90	$90	1	20	1	Sample 1 well each year for the first 20 years.	$0	$90	$14	$9	**$113**	$10	**$122**	$18	$12	**$153**	45%	$69	**$221**	$44	$0
8	Groundwater	MNA	02 Sampling Crew	2	team/hr	$438	$876	1	20	1	Sample 1 well each year for the first 20 years, 2 hours per sample.	$0	$876	$131	$88	**$1,095**	$94	**$1,189**	$178	$119	**$1,486**	45%	$669	**$2,154**	$431	$0
8	Groundwater	MNA	21 Tritium - Low Level (water)	38	EA	$90	$3,420	21	25	1	Sample 32 existing and 6 new wells.	$0	$3,420	$513	$342	**$4,275**	$368	**$4,643**	$696	$464	**$5,803**	45%	$2,611	**$8,415**	$1,683	$0
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	21	25	1	Sample 32 existing and 6 new wells, 2 hours per sample	$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
-		ICs & Site Closeout - 23 Deep ROM Sites										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	67	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978

10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	49	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	14	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	59	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	136	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	93	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	121	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	26	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**118-B-1 - ICs & closeout (Shallow Contamination)**					$0			1		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	45%	$0	$0	$0	$0
4	118-B-1 (burial grd)	Institutional Controls	850 No dig/drilling institutional control	1.0	EA	$5,978	$5,978	0	40	1	ICs until year 2056 for shallow soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
4	118-B-1 (burial grd)	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	40	40	1	Closeout report at year 2056 or MNA	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

PERIODIC O&M COST / PERIODIC O&M MARKUPS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES	MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Contingency 15%	Contingency 10%	SUBTOTAL	Technical Support Services Percent	Technical Support Services Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
-			**MNA - sampling first year (new wells)**																							
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	24	EA	$165	$3,960	0	0	1	First year, quarterly sampling in the 6 new wells	$0	$3,960	$594	$396	**$4,950**	$426	**$5,376**	$806	$538	**$6,720**	45%	$3,024	**$9,743**	$1,949	$0
8	Groundwater	MNA	02 Sampling Crew	48	team/hr	$438	$21,015	0	0	1	First year, quarterly sampling in the 6 new wells (assume 2 hours per sample)	$0	$21,015	$3,152	$2,102	**$26,269**	$2,259	**$28,528**	$4,279	$2,853	**$35,660**	45%	$16,047	**$51,707**	$10,341	$0
-			**MNA - sampling out years 11 - 15 for hex chromium**																							
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	20	EA	$22	$440	11	15	2	Samples/Event (Out Years) [Years 11-15] 5 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$440	$66	$44	**$550**	$47	**$597**	$90	$60	**$747**	45%	$336	**$1,083**	$217	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	15	2	Samples/Event (Out Years) [Years 11-15] 5 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
-			**MNA - sampling out years 16 - 20 for hex chromium (post remedy)**																							
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	42	EA	$22	$924	16	20	1	Samples/Event (Out Years) [Years 16-20] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$924	$139	$92	**$1,155**	$99	**$1,254**	$188	$125	**$1,568**	45%	$706	**$2,273**	$455	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	16	20	1	Samples/Event (Out Years) [Years 16-20] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-			**MNA - sampling out years 11 - 70 for strantium-90**																							
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	20	EA	$113	$2,260	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$2,260	$339	$226	**$2,825**	$243	**$3,068**	$460	$307	**$3,835**	45%	$1,726	**$5,561**	$1,112	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
-			**MNA - sampling out years 71 - 75 for strantium-90 (post remedy)**																							
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	42	EA	$113	$4,746	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$4,746	$712	$475	**$5,933**	$510	**$6,443**	$966	$644	**$8,053**	45%	$3,624	**$11,677**	$2,335	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
-			**Extraction Wells maintenance**																							
8	Groundwater	well maintenance	350 Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	7	EA	$4,499	$31,493	5	15	5	replacing pumps in extraction wells every 5 years	$0	$31,493	$4,724	$3,149	**$39,366**	$3,385	**$42,752**	$6,413	$4,275	**$53,440**	45%	$24,048	**$77,488**	$15,498	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	14	Crew Hr	$529	$7,401	5	15	5	replacing pumps in extraction wells every 5 years, assume 2 hours per well to replace pumps	$0	$7,401	$1,110	$740	**$9,251**	$796	**$10,047**	$1,507	$1,005	**$12,558**	45%	$5,651	**$18,210**	$3,642	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	900	LF	$546	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	30	Team/Hr	$1,539	$46,158	5	15	5	5 hours per well (extraction) every 5 years to maintain the wells	$0	$46,158	$6,924	$4,616	**$57,698**	$0	**$57,698**	$8,655	$5,770	**$72,122**	45%	$32,455	**$104,577**	$20,915	$0
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$0				decommission wells (deep) (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$0				decommission wells (shallow) (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$7,000	15	15	1	final decommission wells (deep)	$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
8	Groundwater	well maintenance	357 Decommission shallow well	4	LS	$2,500	$10,000	15	15	1	final decommission wells (shallow)	$0	$10,000	$1,500	$1,000	**$12,500**	$1,075	**$13,575**	$2,036	$1,358	**$16,969**	45%	$7,636	**$24,605**	$4,921	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	90.00	HR	$103	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	89.80	ton	$83	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
-			**Injection Wells maintenance**																							
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$0				replace injection wells every 15 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	20	Team/Hr	$1,539	$30,772	2	15	2	5 hours per well (injection) every 2 years to maintain the wells	$0	$30,772	$4,616	$3,077	**$38,465**	$0	**$38,465**	$5,770	$3,847	**$48,081**	45%	$21,637	**$69,718**	$13,944	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$0				Decommission Injection Wells every 15 years with replacement (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	15	15	1	final Decommission Injection Wells	$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$0				replace injection wells every 15 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	60	ton	$83	$0				replace injection wells every 15 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0

PERIODIC O&M COST												PERIODIC O&M MARKUPS															
-		WBS				UNIT		START	END			MDBI		Overhead	Profit		WA States Sales Tax		Contingency			Technical Support Services				CHPRC G&A	Institutional
SITE	SITE NAME	Top Tier	DESCRIPTION	QTY	UNIT	COST	SUBTOTAL	YEAR	YEAR	INTERVAL	NOTES	0%	SUBTOTAL	15%	10%	SUBTOTAL	8.6%	SUBTOTAL	15%	10%	SUBTOTAL	Percent	Subtotal		SUBTOTAL	20.00%	Controls
-			**Monitor Wells maintenance**																								
8	Groundwater	well maintenance	368 Grundfos MW Pump - 10 gpm, 2" pump	20	EA	$1,500	$30,000	10	75	10	20 wells, replacing pumps every 10 years, assume 2 hours per well to replace pumps (monitoring wells)	$0	$30,000	$4,500	$3,000	**$37,500**	$3,225	**$40,725**	$6,109	$4,073	**$50,906**	45%	$22,908		**$73,814**	$14,763	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	40	Crew Hr	$529	$21,145	10	75	10	Monitoring well pump replacement (2 hours per well) (assume 20 wells in the outyears)	$0	$21,145	$3,172	$2,115	**$26,432**	$2,273	**$28,705**	$4,306	$2,870	**$35,881**	45%	$16,146		**$52,028**	$10,406	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	200	Team/Hr	$1,539	$307,721	10	75	10	Monitoring well rehab every 10 years (10 hours per well) (assume 20 wells in the outyears)	$0	$307,721	$46,158	$30,772	**$384,651**	$0	**$384,651**	$57,698	$38,465	**$480,814**	33%	$158,668		**$639,482**	$127,896	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	2000	LF	$546	$1,092,000	25	75	25	Monitoring well replacement every 25 years , 20 wells	$0	$1,092,000	$163,800	$109,200	**$1,365,000**	$117,390	**$1,482,390**	$222,359	$148,239	**$1,852,988**	26%	$481,777		**$2,334,764**	$466,953	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	25	75	25	decommission 20 wells for replacement	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198		**$157,979**	$31,596	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	75	75	1	final decommission of 20 wells	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198		**$157,979**	$31,596	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	200.00	HR	$103	$20,618	25	75	25	Monitoring well replacement every 25 years, 20 wells, assume 1 hr per 10 LF for geologist.	$0	$20,618	$3,093	$2,062	**$25,773**	$2,216	**$27,989**	$4,198	$2,799	**$34,986**	45%	$15,744		**$50,730**	$10,146	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	261.92	ton	$83	$21,740	25	75	25	Monitoring well replacement every 25 years (5deep (200) + 5 shallow (100) + 10 deep (200)). Assume 2,900 lbs per cy. Shallow wells = 5.1611 cy, deep wells = 10.32202 cy	$0	$21,740	$3,261	$2,174	**$27,174**	$2,337	**$29,511**	$4,427	$2,951	**$36,889**	45%	$16,600		**$53,489**	$10,698	$0

Table B-6. Alternative 7 Cost Estimate Details

Alternative 07
NA with ICs, and Aggressive RTD for Waste Sites; and Cr(VI) and Sr-90 Source Treatment with P&T and MNA with ICs for GW

Location:	100-BC-1, 100-BC-2, 100-BC-5	**Base Year:**	2016
Phase:	RI/FS	**Date:**	10/25/2016
Description:	Natural Attenuation with ICs, and Aggressive RTD for Waste Sites; Cr(VI) and Strontium-90 Source Treatment, and P&T and MNA with and ICs for Groundwater		

CAPITAL COSTS

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-			**Excavation - Site 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Excavation	110 Excavation Crew (#42) Un-contaminated	153	Crew Hr	$904	$138,267	0	0	1	2 - 50 foot segments of pipe reroute water lines, non contaminated soil removal
1	100-B-34 (Radioactive Process sewer)	Excavation	111 Excavation Crew (#43) Contaminated	2	Crew Hr	$1,223	$1,953	0	0	1	2 - 50 foot segments of pipe reroute water lines, non contaminated soil removal
1	100-B-34 (Radioactive Process sewer)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$5,023	0	0	1	excavator per month based on crew hours for the 2 - 50 foot pipes
2	100-B-34 (Dichromate Transfer Line)	Excavation	110 Excavation Crew (#42) Un-contaminated	87	Crew Hr	$904	$79,046	0	0	1	1 - 55 ft pipe segment 6 ft below ground
2	100-B-34 (Dichromate Transfer Line)	Excavation	111 Excavation Crew (#43) Contaminated	4	Crew Hr	$1,223	$5,301	0	0	1	1 - 55 ft pipe segment 6 ft below ground (assume a minum of 5 hours)
2	100-B-34 (Dichromate Transfer Line)	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$2,983	0	0	1	excavator per month based on crew hours for the 1 - 55 foot pipes
1	100-B-34 (Radioactive Process sewer)	Excavation	118 Fuel - Diesel	118	gal	$4	$431	0	0	1	excavator fuel (assume 3.1 gph)
1	100-B-34 (Radioactive Process sewer)	Excavation	119 Fuel Delivery	118	gal	$2	$210	0	0	1	fuel delivery
1	100-B-34 (Radioactive Process sewer)	Excavation	05 OPERATOR GROUP VIII	155	HR	$70	$10,812	0	0	1	operators for the excavators for both 3 pipelines
1	100-B-34 (Radioactive Process sewer)	Excavation	145 Move water main	1	LS	$1,200,000	$780,000	0	0	1	Move water main above sewer lines
-			**Sampling & Analysis: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for 2 lines (2 hours per sample)
2	100-B-34 (Dichromate Transfer Line)	Sampling	252 Sampling Crew	2	Team/Hr	$438	$876	0	0	1	sampling crew for dichromate (2 hours per sample)
1	100-B-34 (Radioactive Process sewer)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analysis for 2 lines
2	100-B-34 (Dichromate Transfer Line)	Sampling	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analysis for dichromate line
-			**ERDF Disposal: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (2 segments)
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assume 1 sample during ERDF loading and disposal (dichromate transfer line)
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	811 ERDF WG	125	Ton	$83	$10,339	0	0	1	disposal of soil from 2 - pipe segments
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	811 ERDF WG	19	Ton	$83	$1,616	0	0	1	disposal of soil from dichromate transfer line
-			**Backfill: 100-B-34 (Sewer Line)**								
1	100-B-34 (Radioactive Process sewer)	Backfill	133 Backfill and soil cover crew (#46)	133	Crew Hr	$1,359	$180,532	0	0	1	backfill crew, assume LCY/185 hrs (2 segments of pipe)
2	100-B-34 (Dichromate Transfer Line)	Backfill	133 Backfill and soil cover crew (#46)	203	Crew Hr	$1,359	$276,493	0	0	1	backfill crew, assume LCY/185 hrs (dichromate transfer line)
-			**116-C-1 Apatite Injection - for Chromium**								
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	500 Mobilize & Reburbish Skids	0.041	LS	$34,891	$1,421	0	0	1	mobilization of drill rig and skids
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	501 Sampling Support	0.041	LS	$32,936,751	$1,341,851	0	0	1	sampling during installation
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	502 Shallow Temp Wells Installation	0.041	LS	$76,480,595	$3,115,838	0	0	1	306 temp wells installed
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	503 Demobilize	0.041	LS	$89,836	$3,660	0	0	1	demoblization of drill rig and skids
9	Groundwater - Source Treatment	Cr(VI) Groundwater Sources	511 Drilling	0.041	LS	$218,780	$8,913	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607. This cost includes disposal of cuttings and drilling oversight.
-			**Excavation - site 118-B-1**								
4	118-B-1 (burial grd)	Excavation	111 Excavation Crew (#43) Contaminated	2,015	Crew Hr	$1,223	$2,464,245	0	0	1	excavation during contaminated areas based on cy/60hrs
4	118-B-1 (burial grd)	Excavation	110 Excavation Crew (#42) Un-contaminated	1,717	Crew Hr	$904	$1,551,832	0	0	1	excavation during uncontaminated areas based on cy/180hrs
4	118-B-1 (burial grd)	Excavation	114 Excavator (Contaminated)	13	MO	$5,200	$65,474	0	0	1	excavator time based on crew time for excavating contaminated soil
4	118-B-1 (burial grd)	Excavation	113 Excavator (Un-contaminated)	11	MO	$5,200	$55,793	0	0	1	excavator time based on crew time for excavating non contaminated soil
4	118-B-1 (burial grd)	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	8	EA	$165	$1,396	0	0	1	analytical during excavaion to verify clean based on SF/6724
-			**ERDF Disposal & Backfill - site 118-B-1**								

CAPITAL MARKUPS

MDBI 10%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Project Management Percent	5%	Remedial Design Percent	6%	Construction Management Percent	6%	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$13,827	$152,094	$22,814	$15,209	**$190,117**	$16,350	**$206,467**	$30,970	$20,647	**$258,084**		$12,904		$15,485		$15,485	**$301,959**	$60,392	$0
$195	$2,149	$322	$215	**$2,686**	$231	**$2,917**	$438	$292	**$3,646**		$182		$219		$219	**$4,266**	$853	$0
$502	$5,525	$829	$553	**$6,907**	$594	**$7,501**	$1,125	$750	**$9,376**		$469		$563		$563	**$10,970**	$2,194	$0
$7,905	$86,951	$13,043	$8,695	**$108,689**	$9,347	**$118,036**	$17,705	$11,804	**$147,545**		$7,377		$8,853		$8,853	**$172,628**	$34,526	$0
$530	$5,831	$875	$583	**$7,288**	$627	**$7,915**	$1,187	$792	**$9,894**		$495		$594		$594	**$11,576**	$2,315	$0
$298	$3,281	$492	$328	**$4,101**	$353	**$4,454**	$668	$445	**$5,568**		$278		$334		$334	**$6,514**	$1,303	$0
$43	$474	$71	$47	**$593**	$51	**$644**	$97	$64	**$805**		$40		$48		$48	**$942**	$188	$0
$21	$231	$35	$23	**$289**	$25	**$314**	$47	$31	**$393**		$20		$24		$24	**$459**	$92	$0
$1,081	$11,893	$1,784	$1,189	**$14,866**	$1,278	**$16,144**	$2,422	$1,614	**$20,181**		$1,009		$1,211		$1,211	**$23,611**	$4,722	$0
$78,000	$858,000	$128,700	$85,800	**$1,072,500**	$92,235	**$1,164,735**	$174,710	$116,474	**$1,455,919**		$72,796		$87,355		$87,355	**$1,703,425**	$340,685	$0
$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**		$82		$98		$98	**$1,912**	$382	$0
$88	$963	$144	$96	**$1,204**	$104	**$1,308**	$196	$131	**$1,634**		$82		$98		$98	**$1,912**	$382	$0
$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**		$15		$18		$18	**$360**	$72	$0
$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**		$15		$18		$18	**$360**	$72	$0
$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**		$46		$56		$56	**$1,085**	$217	$0
$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**		$46		$56		$56	**$1,085**	$217	$0
$1,034	$11,373	$1,706	$1,137	**$14,216**	$1,223	**$15,439**	$2,316	$1,544	**$19,299**		$965		$1,158		$1,158	**$22,580**	$4,516	$0
$162	$1,778	$267	$178	**$2,222**	$191	**$2,413**	$362	$241	**$3,016**		$151		$181		$181	**$3,529**	$706	$0
$18,053	$198,585	$29,788	$19,859	**$248,232**	$21,348	**$269,580**	$40,437	$26,958	**$336,975**		$16,849		$20,218		$20,218	**$394,260**	$78,852	$0
$27,649	$304,142	$45,621	$30,414	**$380,178**	$32,695	**$412,873**	$61,931	$41,287	**$516,091**		$25,805		$30,965		$30,965	**$603,827**	$120,765	$0
$142	$1,564	$235	$156	**$1,955**	$168	**$2,123**	$318	$212	**$2,653**		$133		$159		$159	**$3,104**	$621	$0
$134,185	$1,476,037	$221,405	$147,604	**$1,845,046**	$158,674	**$2,003,720**	$300,558	$200,372	**$2,504,649**		$125,232		$150,279		$150,279	**$2,930,440**	$586,088	$0
$311,584	$3,427,422	$514,113	$342,742	**$4,284,278**	$368,448	**$4,652,726**	$697,909	$465,273	**$5,815,907**		$290,795		$348,954		$348,954	**$6,804,611**	$1,360,922	$0
$366	$4,026	$604	$403	**$5,032**	$433	**$5,465**	$820	$547	**$6,832**		$342		$410		$410	**$7,993**	$1,599	$0
$891	$9,804	$1,471	$980	**$12,256**	$1,054	**$13,310**	$1,996	$1,331	**$16,637**		$832		$998		$998	**$19,465**	$3,893	$0
$246,425	$2,710,670	$406,600	$271,067	**$3,388,337**	$291,397	**$3,679,734**	$551,960	$367,973	**$4,599,668**		$229,983		$275,980		$275,980	**$5,381,611**	$1,076,322	$0
$155,183	$1,707,015	$256,052	$170,702	**$2,133,769**	$183,504	**$2,317,273**	$347,591	$231,727	**$2,896,592**		$144,830		$173,796		$173,796	**$3,389,012**	$677,802	$0
$6,547	$72,022	$10,803	$7,202	**$90,027**	$7,742	**$97,769**	$14,665	$9,777	**$122,212**		$6,111		$7,333		$7,333	**$142,988**	$28,598	$0
$5,579	$61,372	$9,206	$6,137	**$76,715**	$6,597	**$83,312**	$12,497	$8,331	**$104,141**		$5,207		$6,248		$6,248	**$121,844**	$24,369	$0
$140	$1,535	$230	$154	**$1,919**	$165	**$2,084**	$313	$208	**$2,605**		$130		$156		$156	**$3,048**	$610	$0

4	118-B-1 (burial grd)	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	107	EA	$497	$53,015	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification		$5,302	$58,317	$8,748	$5,832	**$72,896**	$6,269	**$79,165**	$11,875	$7,917	**$98,957**	$4,948	$5,937	$5,937	**$115,779**	$23,156	$0
4	118-B-1 (burial grd)	ERDF Disposal	811 ERDF WG	120,875	Ton	$83	$10,032,661	0	0	1	CY of contaminated soild going to ERDF	10,667	$1,003,266	$11,035,928	$1,655,389	$1,103,593	**$13,794,909**	$1,186,362	**$14,981,272**	$2,247,191	$1,498,127	**$18,726,590**	$936,329	$1,123,595	$1,123,595	**$21,910,110**	$4,382,022	$0
4	118-B-1 (burial grd)	Backfill	133 Backfill and soil cover crew (#46)	2,266	Crew Hr	$1,359	$3,080,254	0	0	1	backfill crew based on cy/185		$308,025	$3,388,280	$508,242	$338,828	**$4,235,349**	$364,240	**$4,599,590**	$689,938	$459,959	**$5,749,487**	$287,474	$344,969	$344,969	**$6,726,900**	$1,345,380	$0
4	118-B-1 (burial grd)	Backfill	112 DumpTrucks	14	MO	$6,200	$87,805	0	0	1	Trucks from borrow pit		$8,780	$96,585	$14,488	$9,659	**$120,731**	$10,383	**$131,114**	$19,667	$13,111	**$163,893**	$8,195	$9,834	$9,834	**$191,755**	$38,351	$0
4	118-B-1 (burial grd)	Backfill	134 Front End Loader	37	MO	$15,500	$580,980	0	0	1	front end loader to deliver and sprad backfill soil		$58,098	$639,078	$95,862	$63,908	**$798,848**	$68,701	**$867,549**	$130,132	$86,755	**$1,084,436**	$54,222	$65,066	$65,066	**$1,268,790**	$253,758	$0
4	118-B-1 (burial grd)	Backfill	137 Water Truck	37	MO	$6,200	$232,392	0	0	1	water truck		$23,239	$255,631	$38,345	$25,563	**$319,539**	$27,480	**$347,019**	$52,053	$34,702	**$433,774**	$21,689	$26,026	$26,026	**$507,516**	$101,503	$0
4	118-B-1 (burial grd)	Backfill	139 Revegetate area	6	Ac	$5,010	$31,876	0	0	1	revegetate area		$3,188	$35,063	$5,260	$3,506	**$43,829**	$3,769	**$47,599**	$7,140	$4,760	**$59,498**	$2,975	$3,570	$3,570	**$69,613**	$13,923	$0
4	118-B-1 (burial grd)	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$120,000	0	0	1	survey tent $120000 (allowance)		$12,000	$132,000	$19,800	$13,200	**$165,000**	$14,190	**$179,190**	$26,879	$17,919	**$223,988**	$11,199	$13,439	$13,439	**$262,065**	$52,413	$0
4	118-B-1 (burial grd)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	2,133	Crew Hr	$232	$494,526	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$49,453	$543,979	$81,597	$54,398	**$679,973**	$0	**$679,973**	$101,996	$67,997	**$849,967**	$42,498	$50,998	$50,998	**$994,461**	$198,892	$0
-		**Apatite Injection - for Strontium -90**																										
9	Groundwater - Source Treatment	Sr-90 Groundwater Sources	500 Mobilize & Reburbish Skids	0.96	LS	$34,891	$33,469	0	0	1	mobilization of drill rig and skids		$3,347	$36,816	$5,522	$3,682	**$46,020**	$3,958	**$49,978**	$7,497	$4,998	**$62,472**	$3,124	$3,748	$3,748	**$73,093**	$14,619	$0
9	Groundwater - Source Treatment	Sr-90 Groundwater Sources	501 Sampling Support	0.96	LS	$32,936,751	$31,594,900	0	0	1	sampling during installation		$3,159,490	$34,754,390	$5,213,158	$3,475,439	**$43,442,987**	$3,736,097	**$47,179,084**	$7,076,863	$4,717,908	**$58,973,855**	$2,948,693	$3,538,431	$3,538,431	**$68,999,410**	$13,799,882	$0
9	Groundwater - Source Treatment	Sr-90 Groundwater Sources	502 Shallow Temp Wells Installation	0.96	LS	$76,480,595	$73,364,757	0	0	1	7,205 temp wells installed		$7,336,476	$80,701,232	$12,105,185	$8,070,123	**$100,876,540**	$8,675,382	**$109,551,923**	$16,432,788	$10,955,192	**$136,939,904**	$6,846,995	$8,216,394	$8,216,394	**$160,219,687**	$32,043,937	$0
9	Groundwater - Source Treatment	Sr-90 Groundwater Sources	503 Demobilize	0.96	LS	$89,836	$86,176	0	0	1	demoblization of drill rig and skids		$8,618	$94,794	$14,219	$9,479	**$118,492**	$10,190	**$128,682**	$19,302	$12,868	**$160,853**	$8,043	$9,651	$9,651	**$188,198**	$37,640	$0
9	Groundwater - Source Treatment	Sr-90 Groundwater Sources	511 Drilling	0.96	LS	$218,780	$209,867	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607. This cost includes disposal of cuttings and drilling supplies		$20,987	$230,854	$34,628	$23,085	**$288,567**	$24,817	**$313,384**	$47,008	$31,338	**$391,730**	$19,586	$23,504	$23,504	**$458,324**	$91,665	$0
-		**Excavation - site 118-B-8:4**																										
5	118-B-8:4	Excavation	111 Excavation Crew (#43) Contaminated	15	Crew Hr	$1,223	$18,287	0	0	1	excavation during contaminated areas based on cy/60hrs		$1,829	$20,115	$3,017	$2,012	**$25,144**	$2,162	**$27,307**	$4,096	$2,731	**$34,133**	$1,707	$2,048	$2,048	**$39,936**	$7,987	$0
5	118-B-8:4	Excavation	110 Excavation Crew (#42) Un-contaminated	128	Crew Hr	$904	$115,639	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$11,564	$127,203	$19,080	$12,720	**$159,004**	$13,674	**$172,678**	$25,902	$17,268	**$215,848**	$10,792	$12,951	$12,951	**$252,542**	$50,508	$0
5	118-B-8:4	Excavation	114 Excavator (Contaminated)	1	MO	$5,200	$5,200	0	0	1	excavator time based on crew time for excavating contaminated soil		$520	$5,720	$858	$572	**$7,150**	$615	**$7,765**	$1,165	$776	**$9,706**	$485	$582	$582	**$11,356**	$2,271	$0
5	118-B-8:4	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$4,158	0	0	1	excavator time based on crew time for excavating non contaminated soil		$416	$4,573	$686	$457	**$5,717**	$492	**$6,208**	$931	$621	**$7,760**	$388	$466	$466	**$9,080**	$1,816	$0
5	118-B-8:4	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analytical during excavaion to verify clean based on SF/6724		$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**ERDF Disposal & Backfill - site 118-B-8:4**																										
5	118-B-8:4	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	1	EA	$497	$497	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	90	$50	$547	$82	$55	**$683**	$59	**$742**	$111	$74	**$928**	$46	$56	$56	**$1,085**	$217	$0
5	118-B-8:4	ERDF Disposal	811 ERDF WG	1166	Ton	$83	$96,785	0	0	1	CY of contaminated soild going to ERDF		$9,679	$106,464	$15,970	$10,646	**$133,080**	$11,445	**$144,525**	$21,679	$14,452	**$180,656**	$9,033	$10,839	$10,839	**$211,368**	$42,274	$0
5	118-B-8:4	Backfill	133 Backfill and soil cover crew (#46)	115	Crew Hr	$1,359	$156,990	0	0	1	backfill crew based on cy/185		$15,699	$172,689	$25,903	$17,269	**$215,861**	$18,564	**$234,425**	$35,164	$23,442	**$293,031**	$14,652	$17,582	$17,582	**$342,847**	$68,569	$0
5	118-B-8:4	Backfill					$0						$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	Backfill	112 DumpTrucks	2	MO	$6,200	$10,011	0	0	1	Trucks from borrow pit		$1,001	$11,013	$1,652	$1,101	**$13,766**	$1,184	**$14,950**	$2,242	$1,495	**$18,687**	$934	$1,121	$1,121	**$21,864**	$4,373	$0
5	118-B-8:4	Backfill	134 Front End Loader	2	MO	$15,500	$25,029	0	0	1	front end loader to deliver and sprad backfill soil		$2,503	$27,532	$4,130	$2,753	**$34,414**	$2,960	**$37,374**	$5,606	$3,737	**$46,718**	$2,336	$2,803	$2,803	**$54,660**	$10,932	$0
5	118-B-8:4	Backfill	137 Water Truck	2	MO	$6,200	$10,011	0	0	1	water truck		$1,001	$11,013	$1,652	$1,101	**$13,766**	$1,184	**$14,950**	$2,242	$1,495	**$18,687**	$934	$1,121	$1,121	**$21,864**	$4,373	$0
5	118-B-8:4	Backfill	139 Revegetate area	0	Ac	$5,010	$2,412	0	0	1	revegetate area		$241	$2,653	$398	$265	**$3,317**	$285	**$3,602**	$540	$360	**$4,502**	$225	$270	$270	**$5,268**	$1,054	$0
5	118-B-8:4						$0	0	0	1			$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
5	118-B-8:4	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	18	Crew Hr	$232	$4,158	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$416	$4,574	$686	$457	**$5,718**	$0	**$5,718**	$858	$572	**$7,147**	$357	$429	$429	**$8,362**	$1,672	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	115	HR	$70	$8,079	0	0	1	truck drivers		$808	$8,887	$1,333	$889	**$11,108**	$955	**$12,064**	$1,810	$1,206	**$15,079**	$754	$905	$905	**$17,643**	$3,529	$0
5	118-B-8:4	Backfill	05 OPERATOR GROUP VIII	517	HR	$70	$36,147	0	0	1	operators for water truck and front end loader		$3,615	$39,761	$5,964	$3,976	**$49,702**	$4,274	**$53,976**	$8,096	$5,398	**$67,470**	$3,373	$4,048	$4,048	**$78,940**	$15,788	$0
5	118-B-8:4	Excavation	118 Fuel - Diesel	24	gal	$4	$87	0	0	1	fuel		$9	$96	$14	$10	**$120**	$10	**$130**	$20	$13	**$163**	$8	$10	$10	**$191**	$38	$0
5	118-B-8:4	Excavation	119 Fuel Delivery	24	gal	$2	$43	0	0	1	fuel delivery		$4	$47	$7	$5	**$59**	$5	**$64**	$10	$6	**$80**	$4	$5	$5	**$93**	$19	$0
-		**Excavation - site 116-B-6A**																										
7	116-B-6A/116-B-16 Tank	Excavation	111 Excavation Crew (#43) Contaminated	40	Crew Hr	$1,223	$49,254	0	0	1	excavation during contaminated areas based on cy/60hrs		$4,925	$54,180	$8,127	$5,418	**$67,724**	$5,824	**$73,549**	$11,032	$7,355	**$91,936**	$4,597	$5,516	$5,516	**$107,565**	$21,513	$0
7	116-B-6A/116-B-16 Tank	Excavation	110 Excavation Crew (#42) Un-contaminated	218	Crew Hr	$904	$196,816	0	0	1	excavation during uncontaminated areas based on cy/180hrs		$19,682	$216,498	$32,475	$21,650	**$270,622**	$23,274	**$293,896**	$44,084	$29,390	**$367,370**	$18,368	$22,042	$22,042	**$429,822**	$85,964	$0
7	116-B-6A/116-B-16 Tank	Excavation	114 Excavator (Contaminated)	1	MO	$5,200	$5,200	0	0	1	excavator time based on crew time for excavating contaminated soil		$520	$5,720	$858	$572	**$7,150**	$615	**$7,765**	$1,165	$776	**$9,706**	$485	$582	$582	**$11,356**	$2,271	$0
7	116-B-6A/116-B-16 Tank	Excavation	113 Excavator (Un-contaminated)	1	MO	$5,200	$7,076	0	0	1	excavator time based on crew time for excavating non contaminated soil		$708	$7,784	$1,168	$778	**$9,730**	$837	**$10,566**	$1,585	$1,057	**$13,208**	$660	$792	$792	**$15,453**	$3,091	$0
7	116-B-6A/116-B-16 Tank	Excavation	122 Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	1	EA	$165	$165	0	0	1	analytical during excavaion to verify clean based on SF/6724		$17	$182	$27	$18	**$227**	$20	**$246**	$37	$25	**$308**	$15	$18	$18	**$360**	$72	$0
-		**ERDF Disposal & Backfill - site 116-B-6A**																										
7	116-B-6A/116-B-16 Tank	ERDF Disposal	659 ERDF Disposal Soil Cost ($/Sample)	2	EA	$497	$897	0	0	1	assumed 1% of soil going to ERDF will need to be sampled for verification	181	$90	$987	$148	$99	**$1,234**	$106	**$1,340**	$201	$134	**$1,675**	$84	$100	$100	**$1,959**	$392	$0
7	116-B-6A/116-B-16 Tank	ERDF Disposal	811 ERDF WG	2347	Ton	$83	$194,785	0	0	1	CY of contaminated soild going to ERDF		$19,479	$214,264	$32,140	$21,426	**$267,830**	$23,033	**$290,863**	$43,629	$29,086	**$363,579**	$18,179	$21,815	$21,815	**$425,387**	$85,077	$0
7	116-B-6A/116-B-16 Tank	Backfill	133 Backfill and soil cover crew (#46)	257	Crew Hr	$1,359	$350,013	0	0	1	backfill crew based on cy/185		$35,001	$385,014	$57,752	$38,501	**$481,268**	$41,389	**$522,657**	$78,399	$52,266	**$653,321**	$32,666	$39,199	$39,199	**$764,386**	$152,877	$0
7	116-B-6A/116-B-16 Tank	Backfill	112 DumpTrucks	3	MO	$6,200	$19,975	0	0	1	Trucks from borrow pit		$1,997	$21,972	$3,296	$2,197	**$27,465**	$2,362	**$29,827**	$4,474	$2,983	**$37,284**	$1,864	$2,237	$2,237	**$43,622**	$8,724	$0
7	116-B-6A/116-B-16 Tank	Backfill	134 Front End Loader	3	MO	$15,500	$49,936	0	0	1	front end loader to deliver and sprad backfill soil		$4,994	$54,930	$8,240	$5,493	**$68,663**	$5,905	**$74,568**	$11,185	$7,457	**$93,209**	$4,660	$5,593	$5,593	**$109,055**	$21,811	$0
7	116-B-6A/116-B-16 Tank	Backfill	137 Water Truck	3	MO	$6,200	$19,975	0	0	1	water truck		$1,997	$21,972	$3,296	$2,197	**$27,465**	$2,362	**$29,827**	$4,474	$2,983	**$37,284**	$1,864	$2,237	$2,237	**$43,622**	$8,724	$0
7	116-B-6A/116-B-16 Tank	Backfill	139 Revegetate area	1	Ac	$5,010	$6,742	0	0	1	revegetate area		$674	$7,416	$1,112	$742	**$9,270**	$797	**$10,068**	$1,510	$1,007	**$12,585**	$629	$755	$755	**$14,724**	$2,945	$0
7	116-B-6A/116-B-16 Tank	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	36	Crew Hr	$232	$8,369	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.		$837	$9,206	$1,381	$921	**$11,507**	$0	**$11,507**	$1,726	$1,151	**$14,384**	$719	$863	$863	**$16,830**	$3,366	$0
7	116-B-6A/116-B-16 Tank	Backfill	05 OPERATOR GROUP VIII	257	HR	$70	$18,012	0	0	1	truck drivers		$1,801	$19,813	$2,972	$1,981	**$24,766**	$2,130	**$26,896**	$4,034	$2,690	**$33,620**	$1,681	$2,017	$2,017	**$39,335**	$7,867	$0

7	116-B-6A/116-B-16 Tank	Backfill	05 OPERATOR GROUP VIII	1031	HR	$70	$72,118	0	0	1	operators for water truck and front end loader	$7,212	$79,330	$11,900	$7,933	**$99,163**	$8,528	**$107,691**	$16,154	$10,769	**$134,613**	$6,731	$8,077	$8,077	**$157,498**	$31,500	$0
7	116-B-6A/116-B-16 Tank	Excavation	118 Fuel - Diesel	43	gal	$4	$158	0	0	1	fuel	$16	$174	$26	$17	**$217**	$19	**$236**	$35	$24	**$295**	$15	$18	$18	**$345**	$69	$0
7	116-B-6A/116-B-16 Tank	Excavation	119 Fuel Delivery	43	gal	$2	$77	0	0	1	fuel delivery	$8	$85	$13	$8	**$106**	$9	**$115**	$17	$11	**$144**	$7	$9	$9	**$168**	$34	$0
-		**Install 6 New Monitoring Wells**																									
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	600	LF	$546	$327,600	0	0	1	Phase I: 6 new wells = (new monitoring wells)	$32,760	$360,360	$54,054	$36,036	**$450,450**	$38,739	**$489,189**	$73,378	$48,919	**$611,486**	$30,574	$36,689	$36,689	**$715,438**	$143,088	$0
8	Groundwater	well drilling	11 Drilling & Construction (per foot)	400	LF	$546	$218,400	6	6	1	Phase II: 4 new wells (new monitoring wells) - after 5 years	$21,840	$240,240	$36,036	$24,024	**$300,300**	$25,826	**$326,126**	$48,919	$32,613	**$407,657**	$20,383	$24,459	$24,459	**$476,959**	$95,392	$0
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	60	HR	$103	$6,185	0	0	1	assume 10 ft per hour based on number of linear feet	$619	$6,804	$1,021	$680	**$8,505**	$731	**$9,236**	$1,385	$924	**$11,545**	$577	$693	$693	**$13,508**	$2,702	$0
8	Groundwater	well drilling	294 Geologists/Geophysicists/Hydro - S030	40	HR	$103	$4,124	6	6	1	assume 10 ft per hour based on number of linear feet	$412	$4,536	$680	$454	**$5,670**	$488	**$6,158**	$924	$616	**$7,697**	$385	$462	$462	**$9,005**	$1,801	$0
8	Groundwater	well drilling	295 Dispose of drill cuttings	44	ton	$83	$3,625	0	0	1	6 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy	$363	$3,988	$598	$399	**$4,985**	$429	**$5,414**	$812	$541	**$6,767**	$338	$406	$406	**$7,918**	$1,584	$0
8	Groundwater	well drilling	295 Dispose of drill cuttings	29	ton	$83	$2,417	6	6	1	4 wells down to 100 feet. Approximately 16 drums @ 7 cy per drum @ 130 lbs/cy	$242	$2,659	$399	$266	**$3,323**	$286	**$3,609**	$541	$361	**$4,511**	$226	$271	$271	**$5,278**	$1,056	$0
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	9000	LF	$2	$13,500	0	0	1	6 wells, assumed 1,500 LF of power cable for each well	$1,350	$14,850	$2,228	$1,485	**$18,563**	$1,596	**$20,159**	$3,024	$2,016	**$25,199**	$1,260	$1,512	$1,512	**$29,482**	$5,896	$0
8	Groundwater	well drilling	51 Cable, 4/C #2 Type W	6000	LF	$2	$9,000	6	6	1	4 wells, assumed 1,500 LF of power cable for each well	$900	$9,900	$1,485	$990	**$12,375**	$1,064	**$13,439**	$2,016	$1,344	**$16,799**	$840	$1,008	$1,008	**$19,655**	$3,931	$0
-		**Expansion of 100-KW P&T System**																									
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	1	LS	$1,593,940	$1,593,940	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from 300 to 400 GPM)	$159,394	$1,753,334	$263,000	$175,333	**$2,191,668**	$0	**$2,191,668**	$328,750	$219,167	**$2,739,584**	$136,979	$164,375	$164,375	**$3,205,314**	$641,063	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	1	LS	$2,343,434	$2,343,434	0	0	1	cost of expanding the 100KW treatment facility to accommodate the 100-BC-5 Cr 400 GPM throughput (from 300 to 400 GPM)	$234,343	$2,577,777	$386,667	$257,778	**$3,222,222**	$277,111	**$3,499,333**	$524,900	$349,933	**$4,374,166**	$218,708	$262,450	$262,450	**$5,117,774**	$1,023,555	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	5000	LF	$3	$16,400	0	0	1	3" HDPE Transfer Piping, ft (extraction)	$1,640	$18,040	$2,706	$1,804	**$22,550**	$1,939	**$24,489**	$3,673	$2,449	**$30,612**	$1,531	$1,837	$1,837	**$35,816**	$7,163	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPE Transfer Piping, ft (extraction)	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	1050 Pipe Fusion Crew (includes testing)	250	team hr	$907	$226,814	0	0	1	pipe fusion crew to connect pipe lengths, test and place in trench (extraction)	$22,681	$249,496	$37,424	$24,950	**$311,870**	$26,821	**$338,690**	$50,804	$33,869	**$423,363**	$21,168	$25,402	$25,402	**$495,335**	$99,067	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	30 McElroy Fusion Machine	6	WK	$225	$1,406	0	0	1	Weekly rental of fusion machine for fusing pipelines. Using the pipeline fusion crew for time for use of fusion machine (extraction)	$141	$1,547	$232	$155	**$1,934**	$166	**$2,100**	$315	$210	**$2,625**	$131	$157	$157	**$3,071**	$614	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	110 Excavation Crew (#42) Un-contaminated	250	Crew Hr	$904	$225,991	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (extraction)	$22,599	$248,590	$37,288	$24,859	**$310,737**	$26,723	**$337,461**	$50,619	$33,746	**$421,826**	$21,091	$25,310	$25,310	**$493,536**	$98,707	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	100 Project Management Crew	125	Crew Hr	$386	$48,295	0	0	1	Project management at half time during excavation & pipe fusion (extraction)	$4,829	$53,124	$7,969	$5,312	**$66,405**	$5,711	**$72,116**	$10,817	$7,212	**$90,145**	$4,507	$5,409	$5,409	**$105,469**	$21,094	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	17 Freight for HDPE Pipe	14	trip	$2,500	$34,722	0	0	1	frieght for pipe for extraction wells, 20 foot length with 54 pipes per load	$3,472	$38,194	$5,729	$3,819	**$47,743**	$4,106	**$51,849**	$7,777	$5,185	**$64,811**	$3,241	$3,889	$3,889	**$75,829**	$15,166	$0
-		**Extraction wells & equipment**																									
8	Groundwater	Extraction Wells	253 Extraction well(s)	900	LF	$535	$481,500	0	0	1	5 shallow (100') + 2 deep (200') (total of 7) - 8" diameter extraction wells	$48,150	$529,650	$79,448	$52,965	**$662,063**	$56,937	**$719,000**	$107,850	$71,900	**$898,750**	$44,937	$53,925	$53,925	**$1,051,537**	$210,307	$0
8	Groundwater	Extraction Wells	275 Pump Assembly	7	EA	$3,200	$22,400	0	0	1	7 pumps for 7 extraction wells	$2,240	$24,640	$3,696	$2,464	**$30,800**	$2,649	**$33,449**	$5,017	$3,345	**$41,811**	$2,091	$2,509	$2,509	**$48,919**	$9,784	$0
8	Groundwater	Extraction Wells	289 Landing Plate	7	EA	$350	$2,450	0	0	1	7 landing plates for 7 extraction wells	$245	$2,695	$404	$270	**$3,369**	$290	**$3,658**	$549	$366	**$4,573**	$229	$274	$274	**$5,351**	$1,070	$0
8	Groundwater	Extraction Wells	271 Riser Pipe	900	LF	$50	$44,586	0	0	1	riser pipe for each well	$4,459	$49,045	$7,357	$4,904	**$61,306**	$5,272	**$66,578**	$9,987	$6,658	**$83,223**	$4,161	$4,993	$4,993	**$97,370**	$19,474	$0
8	Groundwater	Extraction Wells	279 Disconnect Boxes	7	EA	$400	$2,800	0	0	1	7 disconnect boxes for 7 extraction wells	$280	$3,080	$462	$308	**$3,850**	$331	**$4,181**	$627	$418	**$5,226**	$261	$314	$314	**$6,115**	$1,223	$0
8	Groundwater	Extraction Wells	280 Allowance for Electrical Hookups	1	EA	$228	$228	0	0	1	1 allowance for electrical hookups for the 7 extraction wells	$23	$251	$38	$25	**$314**	$27	**$340**	$51	$34	**$426**	$21	$26	$26	**$498**	$100	$0
8	Groundwater	Extraction Wells	266 #10/4C THHN (tray cable)	900	LF	$2	$1,368	0	0	1	200 LF x 7wells	$137	$1,505	$226	$150	**$1,881**	$162	**$2,043**	$306	$204	**$2,553**	$128	$153	$153	**$2,988**	$598	$0
8	Groundwater	Extraction Wells	285 Pump Setting Crew	70	Team/Hr	$529	$37,004	0	0	1	1 - 10 hour days per well x 7 wells	$3,700	$40,705	$6,106	$4,070	**$50,881**	$4,376	**$55,257**	$8,289	$5,526	**$69,071**	$3,454	$4,144	$4,144	**$80,813**	$16,163	$0
8	Groundwater	Extraction Wells	284 Extraction rack	7	EA	$150,000	$1,050,000	0	0	1	1 extraction well rack per well x 7 wells	$105,000	$1,155,000	$173,250	$115,500	**$1,443,750**	$124,163	**$1,567,913**	$235,187	$156,791	**$1,959,891**	$97,995	$117,593	$117,593	**$2,293,072**	$458,614	$0
8	Groundwater	Extraction Wells	10 Drilling Mobilization, completion, cleanup and demob	7	per well	$36,250	$253,750	0	0	1	drilling mob/demob etc per well x 7 wells	$25,375	$279,125	$41,869	$27,913	**$348,906**	$30,006	**$378,912**	$56,837	$37,891	**$473,640**	$23,682	$28,418	$28,418	**$554,159**	$110,832	$0
8	Groundwater	Extraction Wells	268 Water Level Sensor	7	EA	$1,200	$8,400	0	0	1	7 wells x 1 water level sensor	$840	$9,240	$1,386	$924	**$11,550**	$993	**$12,543**	$1,881	$1,254	**$15,679**	$784	$941	$941	**$18,345**	$3,669	$0
8	Groundwater	Extraction Wells	291 10000 Gallon Norwesco Plastic Potable Water Storage Tank	1	EA	$5,870	$5,870	0	0	1	1 - Influent collection tank, 10,000 gallons	$587	$6,457	$969	$646	**$8,071**	$694	**$8,765**	$1,315	$877	**$10,957**	$548	$657	$657	**$12,819**	$2,564	$0
8	Groundwater	Extraction Wells	28 3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	5000	LF	$3	$16,400	0	0	1	3" HDPE Transfer Piping, ft	$1,640	$18,040	$2,706	$1,804	**$22,550**	$1,939	**$24,489**	$3,673	$2,449	**$30,612**	$1,531	$1,837	$1,837	**$35,816**	$7,163	$0
8	Groundwater	Extraction Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPE Transfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Extraction Wells	1050 Pipe Fusion Crew (includes testing)	250	team hr	$907	$226,814	0	0	1	cost for fusion crew working on injection wells	$22,681	$249,496	$37,424	$24,950	**$311,870**	$26,821	**$338,690**	$50,804	$33,869	**$423,363**	$21,168	$25,402	$25,402	**$495,335**	$99,067	$0
8	Groundwater	Extraction Wells	30 McElroy Fusion Machine	6	WK	$225	$1,406	0	0	1	Pipe fusion machine	$141	$1,547	$232	$155	**$1,934**	$166	**$2,100**	$315	$210	**$2,625**	$131	$157	$157	**$3,071**	$614	$0
8	Groundwater	Extraction Wells	110 Excavation Crew (#42) Un-contaminated	250	Crew Hr	$904	$225,991	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$22,599	$248,590	$37,288	$24,859	**$310,737**	$26,723	**$337,461**	$50,619	$33,746	**$421,826**	$21,091	$25,310	$25,310	**$493,536**	$98,707	$0
8	Groundwater	Extraction Wells	100 Project Management Crew	125	Crew Hr	$386	$48,295	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,829	$53,124	$7,969	$5,312	**$66,405**	$5,711	**$72,116**	$10,817	$7,212	**$90,145**	$4,507	$5,409	$5,409	**$105,469**	$21,094	$0
8	Groundwater	Extraction Wells	17 Freight for HDPE Pipe	14	trip	$2,500	$34,722	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,472	$38,194	$5,729	$3,819	**$47,743**	$4,106	**$51,849**	$7,777	$5,185	**$64,811**	$3,241	$3,889	$3,889	**$75,829**	$15,166	$0
8	Groundwater	Extraction Wells	260 Fiber-optic cable and interfaces	10000	FT	$1	$13,300	0	0	1	Fiber Optic Cable	$1,330	$14,630	$2,195	$1,463	**$18,288**	$1,573	**$19,860**	$2,979	$1,986	**$24,825**	$1,241	$1,490	$1,490	**$29,046**	$5,809	$0
8	Groundwater	Extraction Wells	265 Transfer Station (extraction station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Extraction Wells	293 Fiber Optic Splice Box	4	EA	$1,000	$4,000	0	0	1	splice box every 2,500 running feet of fiber cable	$400	$4,400	$660	$440	**$5,500**	$473	**$5,973**	$896	$597	**$7,466**	$373	$448	$448	**$8,736**	$1,747	$0
8	Groundwater	Extraction Wells	294 Geologists/Geophysicists/Hydro - S030	90	HR	$103	$9,278	0	0	1	assume 10 ft per hour based on number of linear feet	$928	$10,206	$1,531	$1,021	**$12,757**	$1,097	**$13,855**	$2,078	$1,385	**$17,318**	$866	$1,039	$1,039	**$20,262**	$4,052	$0
8	Groundwater	Extraction Wells	50 Globe Valve 3"	7	EA	$1,280	$8,959	0	0	1	1 ball valve per well x 7 wells	$896	$9,854	$1,478	$985	**$12,318**	$1,059	**$13,377**	$2,007	$1,338	**$16,722**	$836	$1,003	$1,003	**$19,564**	$3,913	$0
8	Groundwater	Extraction Wells	51 Cable, 4/C #2 Type W	10500	LF	$2	$15,750	0	0	1	7 wells, assumed 1,500 LF of power cable for each well	$1,575	$17,325	$2,599	$1,733	**$21,656**	$1,862	**$23,519**	$3,528	$2,352	**$29,398**	$1,470	$1,764	$1,764	**$34,396**	$6,879	$0
8	Groundwater	Extraction Wells	295 Dispose of drill cuttings	67	ton	$83	$5,590	0	0	1	5 shallow (100')(5.1611 cy x 4) + 2 deep (200')(10.322cy x 2) (total of 6 wells) - 8" diameter extraction wells. 2,900 lbs/cy	$559	$6,149	$922	$615	**$7,687**	$661	**$8,348**	$1,252	$835	**$10,434**	$522	$626	$626	**$12,208**	$2,442	$0

-		**Excavation - Site 100-B-34 (Sewer Line) - equipment continued**																								
1	100-B-34 (Radioactive Process sewer)	Backfill	112 DumpTrucks	1	MO	$6,200	$5,989	0	0	1	Trucks from borrow pit	$599	$6,588	$988	$659	**$8,235**	$708	**$8,943**	$1,341	$894	**$11,179**	$559	$671	$671	**$13,079**	$2,616	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	134 Front End Loader	1	MO	$15,500	$14,972	0	0	1	front end loader to deliver and spread backfill soil	$1,497	$16,470	$2,470	$1,647	**$20,587**	$1,770	**$22,358**	$3,354	$2,236	**$27,947**	$1,397	$1,677	$1,677	**$32,698**	$6,540	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	137 Water Truck	1	MO	$6,200	$5,989	0	0	1	water truck (entire length of project)	$599	$6,588	$988	$659	**$8,235**	$708	**$8,943**	$1,341	$894	**$11,179**	$559	$671	$671	**$13,079**	$2,616	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	139 Revegetate area	1	Ac	$5,010	$3,571	0	0	1	revegetate area	$357	$3,928	$589	$393	**$4,910**	$422	**$5,332**	$800	$533	**$6,665**	$333	$400	$400	**$7,798**	$1,560	$0
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	819 Survey Tent	1	LS	$120,000	$78,000	0	0	1	survey tent $120000 (allowance)	$7,800	$85,800	$12,870	$8,580	**$107,250**	$9,224	**$116,474**	$17,471	$11,647	**$145,592**	$7,280	$8,736	$8,736	**$170,342**	$34,068	$0
1	100-B-34 (Radioactive Process sewer)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	2	Crew Hr	$232	$444	0	0	1	assume 2 - T050 rad tech - to survey the rolloff boxes. 50 boxes a day x 10 hrs.	$44	$489	$73	$49	**$611**	$0	**$611**	$92	$61	**$764**	$38	$46	$46	**$893**	$179	$0
1	100-B-34 (Radioactive Process sewer)	Backfill	120 Fuel Charge	132.80	Hr	$16	$2,178	0	0	1	fuel during backfill based on cubic feet of backfill	$218	$2,396	$359	$240	**$2,995**	$258	**$3,252**	$488	$325	**$4,065**	$203	$244	$244	**$4,756**	$951	$0
-		**4 new injection wells & equipment & associated Piping**																								
8	Groundwater	Injection Wells	292 SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size (*3.97" I.D.) x **20 ft., †MAX PSI 100 @ 73 Deg. F (PRICE IS PER FOOT. ONLY SOLD IN 20 FT. LENGTHS)	4000	LF	$3	$13,120	0	0	1	4" HDPE Transfer Piping, ft	$1,312	$14,432	$2,165	$1,443	**$18,040**	$1,551	**$19,591**	$2,939	$1,959	**$24,489**	$1,224	$1,469	$1,469	**$28,652**	$5,730	$0
8	Groundwater	Injection Wells	29 8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	10000	LF	$11	$107,500	0	0	1	8" HDPETransfer Piping, ft	$10,750	$118,250	$17,738	$11,825	**$147,813**	$12,712	**$160,524**	$24,079	$16,052	**$200,655**	$10,033	$12,039	$12,039	**$234,767**	$46,953	$0
8	Groundwater	Injection Wells	1050 Pipe Fusion Crew (includes testing)	240	team hr	$907	$217,742	0	0	1	cost for fusion crew working on injection wells	$21,774	$239,516	$35,927	$23,952	**$299,395**	$25,748	**$325,143**	$48,771	$32,514	**$406,428**	$20,321	$24,386	$24,386	**$475,521**	$95,104	$0
8	Groundwater	Injection Wells	30 McElroy Fusion Machine	6	WK	$225	$1,350	0	0	1	Pipe fusion machine	$135	$1,485	$223	$149	**$1,856**	$160	**$2,016**	$302	$202	**$2,520**	$126	$151	$151	**$2,948**	$590	$0
8	Groundwater	Injection Wells	110 Excavation Crew (#42) Un-contaminated	240	Crew Hr	$904	$216,951	0	0	1	Excavation crew based on the slowest crew out in the field which should be the fusion crew. (injection wells)	$21,695	$238,646	$35,797	$23,865	**$298,308**	$25,654	**$323,962**	$48,594	$32,396	**$404,953**	$20,248	$24,297	$24,297	**$473,795**	$94,759	$0
8	Groundwater	Injection Wells	100 Project Management Crew	120	Crew Hr	$386	$46,363	0	0	1	Project management at half time during excavation & pipe fusion (injection wells)	$4,636	$50,999	$7,650	$5,100	**$63,749**	$5,482	**$69,231**	$10,385	$6,923	**$86,539**	$4,327	$5,192	$5,192	**$101,251**	$20,250	$0
8	Groundwater	Injection Wells	17 Freight for HDPE Pipe	13	trip	$2,500	$32,407	0	0	1	freight for pipe for injection wells, 20 foot length with 54 pipes per load	$3,241	$35,648	$5,347	$3,565	**$44,560**	$3,832	**$48,392**	$7,259	$4,839	**$60,490**	$3,025	$3,629	$3,629	**$70,774**	$14,155	$0
8	Groundwater	Injection Wells	254 Injection Well(s)	800	LF	$535	$428,000	0	0	1	4 injection wells drilled down to 200 LF	$42,800	$470,800	$70,620	$47,080	**$588,500**	$50,611	**$639,111**	$95,867	$63,911	**$798,889**	$39,944	$47,933	$47,933	**$934,700**	$186,940	$0
8	Groundwater	Injection Wells	264 Transfer Station (injection station)	1	LS	$805,196	$805,196	0	0	1	Transfer station (includes booster pumps)	$80,520	$885,716	$132,857	$88,572	**$1,107,145**	$95,214	**$1,202,359**	$180,354	$120,236	**$1,502,949**	$75,147	$90,177	$90,177	**$1,758,450**	$351,690	$0
8	Groundwater	Injection Wells	289 Landing Plate	4	EA	$350	$1,400	0	0	1	4 landing plates, 1 for each injection well	$140	$1,540	$231	$154	**$1,925**	$166	**$2,091**	$314	$209	**$2,613**	$131	$157	$157	**$3,057**	$611	$0
8	Groundwater	Injection Wells	271 Riser Pipe	800	LF	$50	$39,632	0	0	1	200 LF x 4 injection wells	$3,963	$43,595	$6,539	$4,360	**$54,494**	$4,686	**$59,180**	$8,877	$5,918	**$73,976**	$3,699	$4,439	$4,439	**$86,551**	$17,310	$0
8	Groundwater	Injection Wells	285 Pump Setting Crew	40	Team/Hr	$529	$21,145	0	0	1	10 hours per well x 4 wells for injection wells (using pump setting crew to cost installation of injection racks)	$2,115	$23,260	$3,489	$2,326	**$29,075**	$2,500	**$31,575**	$4,736	$3,158	**$39,469**	$1,973	$2,368	$2,368	**$46,179**	$9,236	$0
8	Groundwater	Injection Wells	283 Injection Rack	4	EA	$40,000	$160,000	0	0	1	1 injection rack per injection well x 4 wells	$16,000	$176,000	$26,400	$17,600	**$220,000**	$18,920	**$238,920**	$35,838	$23,892	**$298,650**	$14,933	$17,919	$17,919	**$349,421**	$69,884	$0
8	Groundwater	Injection Wells	10 Drilling Mobilization, completion, cleanup and demob	4	per well	$36,250	$145,000	0	0	1	4 wells x mob/demob of crew	$14,500	$159,500	$23,925	$15,950	**$199,375**	$17,146	**$216,521**	$32,478	$21,652	**$270,652**	$13,533	$16,239	$16,239	**$316,662**	$63,332	$0
8	Groundwater	Injection Wells	294 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$8,247	0	0	1	assume 10 ft per hour based on number of linear feet	$825	$9,072	$1,361	$907	**$11,340**	$975	**$12,315**	$1,847	$1,232	**$15,394**	$770	$924	$924	**$18,011**	$3,602	$0
8	Groundwater	Injection Wells	295 Dispose of drill cuttings	60	ton	$83	$4,969	0	0	1	4 deep (200')(10.322cy x 4) - 8" diameter extraction wells. 2,900 lbs/cy	$497	$5,466	$820	$547	**$6,832**	$588	**$7,420**	$1,113	$742	**$9,275**	$464	$556	$556	**$10,852**	$2,170	$0
-		**Insitu Reduction (ISR) for Chromium**																								
8	Groundwater	Cr(VI) Groundwater Sources	507 Mobilize & Reburbish Skids	1	LS	$34,891	$34,891	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$3,489	$38,380	$5,757	$3,838	**$47,975**	$4,126	**$52,101**	$7,815	$5,210	**$65,126**	$3,256	$3,908	$3,908	**$76,197**	$15,239	$0
8	Groundwater	Cr(VI) Groundwater Sources	508 Sampling Support	1	LS	$105,243	$105,243	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$10,524	$115,768	$17,365	$11,577	**$144,709**	$12,445	**$157,154**	$23,573	$15,715	**$196,443**	$9,822	$11,787	$11,787	**$229,838**	$45,968	$0
8	Groundwater	Cr(VI) Groundwater Sources	509 Install Injection System and Inject	1	LS	$255,299	$255,299	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$25,530	$280,829	$42,124	$28,083	**$351,036**	$30,189	**$381,225**	$57,184	$38,123	**$476,531**	$23,827	$28,592	$28,592	**$557,542**	$111,508	$0
8	Groundwater	Cr(VI) Groundwater Sources	510 Demobilize	1	LS	$24,336	$24,336	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$2,434	$26,770	$4,015	$2,677	**$33,462**	$2,878	**$36,340**	$5,451	$3,634	**$45,425**	$2,271	$2,725	$2,725	**$53,147**	$10,629	$0
8	Groundwater	Cr(VI) Groundwater Sources	511 Drilling	1	LS	$218,780	$218,780	0	0	1	ISR system for chromium, this cost is a built up cost based on invoice 7039607.	$21,878	$240,658	$36,099	$24,066	**$300,823**	$25,871	**$326,693**	$49,004	$32,669	**$408,367**	$20,418	$24,502	$24,502	**$477,789**	$95,558	$0
-		**ERDF Disposal & Backfill - site 118-B-1 (continued from above)**																								
4	118-B-1 (burial grd)	Backfill	05 OPERATOR GROUP VIII	2266	HR	$70	$158,510	0	0	1	truck drivers	$15,851	$174,361	$26,154	$17,436	**$217,951**	$18,744	**$236,695**	$35,504	$23,669	**$295,868**	$14,793	$17,752	$17,752	**$346,166**	$69,233	$0
4	118-B-1 (burial grd)	Backfill	05 OPERATOR GROUP VIII	11994	HR	$70	$839,054	0	0	1	operators for water truck and front end loader	$83,905	$922,960	$138,444	$92,296	**$1,153,700**	$99,218	**$1,252,918**	$187,938	$125,292	**$1,566,147**	$78,307	$93,969	$93,969	**$1,832,392**	$366,478	$0
4	118-B-1 (burial grd)	Excavation	118 Fuel - Diesel	622	gal	$4	$2,282	0	0	1	fuel delivery	$228	$2,511	$377	$251	**$3,138**	$270	**$3,408**	$511	$341	**$4,260**	$213	$256	$256	**$4,984**	$997	$0
4	118-B-1 (burial grd)	Excavation	119 Fuel Delivery	622	gal	$2	$1,113	0	0	1	fuel	$111	$1,224	$184	$122	**$1,531**	$132	**$1,662**	$249	$166	**$2,078**	$104	$125	$125	**$2,431**	$486	$0
-		**Excavation - Site 100-B-34 (Dichromate Transfer Line) - continued**										$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	05 OPERATOR GROUP VIII	92	HR	$70	$6,420	0	0	1		$642	$7,062	$1,059	$706	**$8,828**	$759	**$9,587**	$1,438	$959	**$11,984**	$599	$719	$719	**$14,021**	$2,804	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	145 Move water main	0	LS	$1,200,000	$420,000	0	0	1		$42,000	$462,000	$69,300	$46,200	**$577,500**	$49,665	**$627,165**	$94,075	$62,717	**$783,956**	$39,198	$47,037	$47,037	**$917,229**	$183,446	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	112 DumpTrucks	1	MO	$6,200	$3,556	0	0	1		$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	134 Front End Loader	1	MO	$15,500	$8,891	0	0	1		$889	$9,780	$1,467	$978	**$12,225**	$1,051	**$13,276**	$1,991	$1,328	**$16,596**	$830	$996	$996	**$19,417**	$3,883	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	137 Water Truck	1	MO	$6,200	$3,556	0	0	1		$356	$3,912	$587	$391	**$4,890**	$421	**$5,311**	$797	$531	**$6,638**	$332	$398	$398	**$7,767**	$1,553	$0
2	100-B-34 (Dichromate Transfer Line)	Backfill	139 Revegetate area	0	Ac	$5,010	$1,953	0	0	1		$195	$2,148	$322	$215	**$2,685**	$231	**$2,916**	$437	$292	**$3,645**	$182	$219	$219	**$4,264**	$853	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	819 Survey Tent	0	LS	$120,000	$42,000	0	0	1		$4,200	$46,200	$6,930	$4,620	**$57,750**	$4,967	**$62,717**	$9,407	$6,272	**$78,396**	$3,920	$4,704	$4,704	**$91,723**	$18,345	$0
2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	818 Survey ERDF Roll-Offs Before ERDF	0	Crew Hr	$232	$69	0	0	1		$7	$76	$11	$8	**$95**	$0	**$95**	$14	$10	**$119**	$6	$7	$7	**$140**	$28	$0

2	100-B-34 (Dichromate Transfer Line)	ERDF Disposal	120 Fuel Charge	203	Hr	$16	$3,336	0	0	1		$334	$3,669	$550	$367	**$4,587**	$394	**$4,981**	$747	$498	**$6,226**	$311	$374	$374	**$7,285**	$1,457	$0
2	100-B-34 (Dichromate Transfer Line)	Excavation	114 Excavator (Contaminated)	0	MO	$5,200	$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
		Expansion of 100-KW P&T System Prior to Startup					$0	0	0	1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	$0	$0	$0	**$0**	$0	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	261 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	0.25	LS	$1,593,940	$398,485	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$39,849	$438,334	$65,750	$43,833	**$547,917**	$0	**$547,917**	$82,188	$54,792	**$684,896**	$34,245	$41,094	$41,094	**$801,328**	$160,266	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	262 100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	0.25	LS	$2,343,434	$585,859	0	0	1	Refurbish existing 100-KW P&T building and equipment prior to start-up for 100-BC-5 (25% of capital expansion costs)	$58,586	$644,444	$96,667	$64,444	**$805,555**	$69,278	**$874,833**	$131,225	$87,483	**$1,093,542**	$54,677	$65,612	$65,612	**$1,279,444**	$255,889	$0
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	296 pH Adjustment	1	EA	$610,000	$610,000	0	0	1	Cost for adding pH adjustment capability to 100-KW P&T	$61,000	$671,000	$100,650	$67,100	**$838,750**	$72,133	**$910,883**	$136,632	$91,088	**$1,138,603**	$56,930	$68,316	$68,316	**$1,332,166**	$266,433	$0

ANNUAL O&M COST

SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES
-			**Institutional Controls & closeout**								
6	116-B-5 (crib)	Institutional Controls	851 No irrigation institutional control	1	EA	$5,978	$5,978	0	5	1	Site visits, 1 per year until 2021, assume MNA monitoring is associated with these site visits (5 years)
6	116-B-5 (crib)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	5	5	1	2021 - site closeout
-			**MNA & ICs for Groundwater**								
8	Groundwater	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	1	75	1	Institutional controls for 75 years starting in 2016
-			**P&T for 15 years**								
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	356 100 KX Pump & Treat Operating Cost	1	per year	$129,524	$129,524	0	15	1	Assumes Cr(VI) < 10 ug/L after 15 Years of Pump and Treat. Assumes 5 years of post-P&T monitoring for Cr(VI).
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	355 100KX resin cost	207,360,000	per gal	$0.00080	$165,888	0	15	1	resin cost per year, see backup cost tab for more info, "BKUP" (207,360,000 gallons per year is number of gallons at 400gpm)
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	400	gpm	$2,187	$874,800	1	15	1	Annual maintenance of P&T system
8	Groundwater	Cr(VI) Plume/Sr-90 Plume	374 Annual maintenance cost for P&T system 100K	40	gpm	$2,187	$87,480	1	15	1	Annual cost for pH adjustment
-			**MNA - sampling first year (existing wells)**								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	32	EA	$165	$5,280	1	1	1	annual sampling at 32 existing wells
8	Groundwater	MNA	02 Sampling Crew	64	team/hr	$438	$28,020	1	1	1	annual sampling at 32 existing wells (2 hours per well)
-			**MNA - Sampling 2 - 5 years**								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	38	EA	$165	$6,270	2	5	1	annual sampling of 38 wells (new + existing)
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	2	5	1	annual sampling of 38 wells (new + existing) (2 hours per sample)
-			**MNA - Sampling 6 - 10 years**								
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	42	EA	$165	$6,930	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90)
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	6	10	1	Samples/Event (6-10 Years) 5 years- annual sampling of 42 wells (lab analysis for hexavalent chromium and strontium-90) (2 hours per well for sampling)
-			**MNA - sampling 1 - 5 years (every 5 years)**								
8	Groundwater	MNA	21 Tritium - Low Level (water)	0	EA	$90	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for tritium)
8	Groundwater	MNA	02 Sampling Crew	0	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken
8	Groundwater	MNA	22 VOCs (Chloroform, TCE) water	0.00	EA	$79	$0	0	5	1	Samples/Event [Years 1-5] 5 years post-remedy -sampled annually (lab analysis for TCE and chloroform)
8	Groundwater	MNA	02 Sampling Crew	0.00	team/hr	$438	$0	0	5	1	sampling crew at 2 hours per sample taken
-			**100-B-34 ICs & closeout (Deep Contamination)**				$0			1	
1	100-B-34 (Radioactive Process sewer)	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	site visits 1 per year, ICs until 2055
1	100-B-34 (Radioactive Process sewer)	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	Site closeout-final report for radioactive process sewer portion of 100-B-34 in 2055
-			**118-B-8:4 ICs & closeout (Deep Contamination)**				$0			1	
5	118-B-8:4	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	ICs until year 32021 for deep soil
5	118-B-8:4	Site Closeout and Final Reports	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	Closout report at year 32021 of MNA
-			**116-B-6A ICs & closeout (Deep Contamination)**				$0			1	
7	116-B-6A/116-B-16 Tank	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	79	1	Site visits, 1 per year until 2095, assume MNA monitoring is associated with these site visits (79 years).
7	116-B-6A/116-B-16 Tank	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	79	79	1	2095 - site closeout
-			**MNA - sampling Tritium**								
8	Groundwater	MNA	21 Tritium - Low Level (water)	1	EA	$90	$90	1	20	1	Sample 1 well each year for the first 20 years.
8	Groundwater	MNA	02 Sampling Crew	2	team/hr	$438	$876	1	20	1	Sample 1 well each year for the first 20 years, 2 hours per sample.
8	Groundwater	MNA	21 Tritium - Low Level (water)	38	EA	$90	$3,420	21	25	1	Sample 32 existing and 6 new wells.
8	Groundwater	MNA	02 Sampling Crew	76	team/hr	$438	$33,274	21	25	1	Sample 32 existing and 6 new wells, 2 hours per sample
-			**116-C-1 ICs and Closeout (Deep Contamination)**								
3	116-C-1	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	Site visits once a year, ICs until 2485. Irrigation ICs until 2034
3	116-C-1	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	150	150	1	Site Closeout-final report 2485
-			**ICs & Site Closeout - 23 Deep ROM Sites**								
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	67	67	1	100-B-5 to 2083. Additional ICs for 23 Deep ROM costs.

ANNUAL O&M MARKUPS

MDBI 0%	SUBTOTAL	Overhead 15%	Profit 10%	SUBTOTAL	WA States Sales Tax 8.6%	SUBTOTAL	Scope Contingency 15%	Bid Contingency 10%	SUBTOTAL	Technical Support Services Percent	Subtotal	SUBTOTAL	CHPRC G&A 20.00%	Institutional Controls
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$129,524	$19,429	$12,952	**$161,905**	$13,924	**$175,829**	$26,374	$17,583	**$219,786**	33%	$72,529	**$292,315**	$58,463	$0
$0	$165,888	$24,883	$16,589	**$207,360**	$17,833	**$225,193**	$33,779	$22,519	**$281,491**	33%	$92,892	**$374,383**	$74,877	$0
$0	$874,800	$131,220	$87,480	**$1,093,500**	$94,041	**$1,187,541**	$178,131	$118,754	**$1,484,426**	26%	$385,951	**$1,870,377**	$374,075	$0
$0	$87,480	$13,122	$8,748	**$109,350**	$9,404	**$118,754**	$17,813	$11,875	**$148,443**	33%	$48,986	**$197,429**	$39,486	$0
$0	$5,280	$792	$528	**$6,600**	$568	**$7,168**	$1,075	$717	**$8,960**	45%	$4,032	**$12,991**	$2,598	$0
$0	$28,020	$4,203	$2,802	**$35,025**	$3,012	**$38,037**	$5,706	$3,804	**$47,547**	45%	$21,396	**$68,942**	$13,788	$0
$0	$6,270	$941	$627	**$7,838**	$674	**$8,512**	$1,277	$851	**$10,639**	45%	$4,788	**$15,427**	$3,085	$0
$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
$0	$6,930	$1,040	$693	**$8,663**	$745	**$9,407**	$1,411	$941	**$11,759**	45%	$5,292	**$17,051**	$3,410	$0
$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$90	$14	$9	**$113**	$10	**$122**	$18	$12	**$153**	45%	$69	**$221**	$44	$0
$0	$876	$131	$88	**$1,095**	$94	**$1,189**	$178	$119	**$1,486**	45%	$669	**$2,154**	$431	$0
$0	$3,420	$513	$342	**$4,275**	$368	**$4,643**	$696	$464	**$5,803**	45%	$2,611	**$8,415**	$1,683	$0
$0	$33,274	$4,991	$3,327	**$41,592**	$3,577	**$45,169**	$6,775	$4,517	**$56,462**	45%	$25,408	**$81,869**	$16,374	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	100-B-14:1 to 12,110. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	39	39	1	100-B-8:1 to 2055. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:1	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	49	49	1	100-B-8:2 to 2065. Additional ICs for 23 Deep ROM costs. Includes 100-C-6:2, 100-C-6:3, 100-C-6:4	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	100-B-21:4 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-1 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-B-11 to 2247. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	14	14	1	116-B-14 to 2030. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	96	96	1	116-B-2 to 2112. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	59	59	1	116-B-3 to 2075. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	136	136	1	116-B-4 to 2152. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	116-C-2A to 2228. Additional ICs for 23 Deep ROM costs. Includes 116-C-2B and 116-C-2C	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	93	93	1	116-C-3 to 2109. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	121	121	1	116-C-5 to 2137. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	26	26	1	118-B-6 to 2042. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-1 to 8698. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
10	ICs 23 Deep Sites	Institutional Controls	850 No dig/drilling institutional control	1	EA	$5,978	$5,978	0	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
10	ICs 23 Deep Sites	Institutional Controls	950 Site closeout report - Low	1	EA	$19,642	$19,642	150	150	1	118-C-3:2 to 2254. Additional ICs for 23 Deep ROM costs.	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0
-		**118-B-1 - ICs & closeout (Shallow Contamination)**					$0			1		$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
4	118-B-1 (burial grd)	Institutional Controls	850 No dig/drilling institutional control	1.0	EA	$5,978	$5,978	0	40	1	ICs until year 2056 for shallow soil	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$5,978
4	118-B-1 (burial grd)	Site Closeout and Final Reports	950 Site closeout report - Low	1.0	EA	$19,642	$19,642	40	40	1	Closout report at year 2056 of MNA	$0	$19,642	$0	$0	**$19,642**	$1,689	**$21,331**	$3,200	$2,133	**$26,664**	45%	$11,999	**$38,663**	$7,733	$0

PERIODIC O&M COST												PERIODIC O&M MARKUPS														
												MDBI		Overhead	Profit		WA States Sales Tax		Contingency			Technical Support Services			CHPRC G&A	Institutional
SITE	SITE NAME	WBS Top Tier	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	START YEAR	END YEAR	INTERVAL	NOTES	0%	SUBTOTAL	15%	10%	SUBTOTAL	8.6%	SUBTOTAL	15%	10%	SUBTOTAL	Percent	Subtotal	SUBTOTAL	20.00%	Controls
8	Groundwater	MNA	17 Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	24	EA	$165	$3,960	0	0	1	First year, quarterly sampling in the 6 new wells	$0	$3,960	$594	$396	**$4,950**	$426	**$5,376**	$806	$538	**$6,720**	45%	$3,024	**$9,743**	$1,949	$0
8	Groundwater	MNA	02 Sampling Crew	48	team/hr	$438	$21,015	0	0	1	First year, quarterly sampling in the 6 new wells (assume 2 hours per sample)	$0	$21,015	$3,152	$2,102	**$26,269**	$2,259	**$28,528**	$4,279	$2,853	**$35,660**	45%	$16,047	**$51,707**	$10,341	$0
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	20	EA	$22	$440	11	15	2	Samples/Event (Out Years) [Years 11-15] 5 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$440	$66	$44	**$550**	$47	**$597**	$90	$60	**$747**	45%	$336	**$1,083**	$217	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	15	2	Samples/Event (Out Years) [Years 11-15] 5 years (sampling 20 wells every 2 years) (Lab analysis for hexavalent chromium)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
8	Groundwater	MNA	20 Lab analysis GW - total chromium, hexavalent chrominum	42	EA	$22	$924	16	20	1	Samples/Event (Out Years) [Years 16-20] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$924	$139	$92	**$1,155**	$99	**$1,254**	$188	$125	**$1,568**	45%	$706	**$2,273**	$455	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	16	20	1	Samples/Event (Out Years) [Years 16-20] 5 years post-remedy -sampled annually (lab analysis for hexavalent chromium)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	20	EA	$113	$2,260	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$2,260	$339	$226	**$2,825**	$243	**$3,068**	$460	$307	**$3,835**	45%	$1,726	**$5,561**	$1,112	$0
8	Groundwater	MNA	02 Sampling Crew	40	team/hr	$438	$17,513	11	70	2	Samples/Event (Out Years) [Years 11-70] 60 years (sampling 20 wells every 2 years) (Lab analysis for strontium-90)	$0	$17,513	$2,627	$1,751	**$21,891**	$1,883	**$23,773**	$3,566	$2,377	**$29,717**	45%	$13,372	**$43,089**	$8,618	$0
8	Groundwater	MNA	19 Samples/Event Lab analysis for strontium-90 only.	42	EA	$113	$4,746	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$4,746	$712	$475	**$5,933**	$510	**$6,443**	$966	$644	**$8,053**	45%	$3,624	**$11,677**	$2,335	$0
8	Groundwater	MNA	02 Sampling Crew	84	team/hr	$438	$36,776	71	75	1	Samples/Event (Out Years) [Years 71-75] 5 years post-remedy -sampled annually (lab analysis for strontium-90)	$0	$36,776	$5,516	$3,678	**$45,970**	$3,953	**$49,924**	$7,489	$4,992	**$62,405**	45%	$28,082	**$90,487**	$18,097	$0
8	Groundwater	well maintenance	350 Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	7	EA	$4,499	$31,493	5	15	5	replacing pumps in extraction wells every 5 years	$0	$31,493	$4,724	$3,149	**$39,366**	$3,385	**$42,752**	$6,413	$4,275	**$53,440**	45%	$24,048	**$77,488**	$15,498	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	14	Crew Hr	$529	$7,401	5	15	5	replacing pumps in extraction wells every 5 years, assume 2	$0	$7,401	$1,110	$740	**$9,251**	$796	**$10,047**	$1,507	$1,005	**$12,558**	45%	$5,651	**$18,210**	$3,642	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	900	LF	$546	$0				replace extraction wells every 25 years (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	30	Team/Hr	$1,539	$46,158	5	15	5	5 hours per well (extraction) every 5 years to maintain the wells	$0	$46,158	$6,924	$4,616	**$57,698**	$0	**$57,698**	$8,655	$5,770	**$72,122**	45%	$32,455	**$104,577**	$20,915	$0
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$0				decommission wells (deep) (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	357 Decommission shallow well	5	LS	$2,500	$0				decommission wells (shallow) (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	359 Decommission deep well	2	LS	$3,500	$7,000	15	15	1	final decommission wells (deep)	$0	$7,000	$1,050	$700	**$8,750**	$753	**$9,503**	$1,425	$950	**$11,878**	45%	$5,345	**$17,223**	$3,445	$0
8	Groundwater	well maintenance	357 Decommission shallow well	5	LS	$2,500	$12,500	15	15	1	final decommission wells (shallow)	$0	$12,500	$1,875	$1,250	**$15,625**	$1,344	**$16,969**	$2,545	$1,697	**$21,211**	45%	$9,545	**$30,756**	$6,151	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	90.00	HR	$103	$0				replace extraction wells every 25 years (removed - P&T only to 15	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	89.80	ton	$83	$0				replace extraction wells every 25 years (removed - P&T only to 15	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	800	LF	$546	$0				replace injection wells every 15 years (removed - P&T only to 15	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	20	Team/Hr	$1,539	$30,772	2	15	2	5 hours per well (injection) every 2 years to maintain the wells	$0	$30,772	$4,616	$3,077	**$38,465**	$0	**$38,465**	$5,770	$3,847	**$48,081**	45%	$21,637	**$69,718**	$13,944	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$0				Decommission Injection Wells every 15 years with replacement (removed - P&T only to 15 years)	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	359 Decommission deep well	4	LS	$3,500	$14,000	15	15	1	final Decommission Injection Wells	$0	$14,000	$2,100	$1,400	**$17,500**	$1,505	**$19,005**	$2,851	$1,901	**$23,756**	45%	$10,690	**$34,447**	$6,889	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	80	HR	$103	$0				replace injection wells every 15 years (removed - P&T only to 15	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	60	ton	$83	$0				replace injection wells every 15 years (removed - P&T only to 15	$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
-			**Monitor Wells maintenance**									$0	$0	$0	$0	**$0**	$0	**$0**	$0	$0	**$0**	45%	$0	**$0**	$0	$0
8	Groundwater	well maintenance	368 Grundfos MW Pump - 10 gpm, 2" pump	20	EA	$1,500	$30,000	10	75	10	20 wells, replacing pumps every 10 years, assume 2 hours per well to replace pumps (monitoring	$0	$30,000	$4,500	$3,000	**$37,500**	$3,225	**$40,725**	$6,109	$4,073	**$50,906**	45%	$22,908	**$73,814**	$14,763	$0
8	Groundwater	well maintenance	365 Pump Setting Crew	40	Crew Hr	$529	$21,145	10	75	10	Monitoring well pump replacement (2 hours per well) (assume 20 wells in the outyears)	$0	$21,145	$3,172	$2,115	**$26,432**	$2,273	**$28,705**	$4,306	$2,870	**$35,881**	45%	$16,146	**$52,028**	$10,406	$0
8	Groundwater	well maintenance	351 Well Maintenance Crew	200	Team/Hr	$1,539	$307,721	10	75	10	Monitoring well rehab every 10 years (10 hours per well) (assume 20 wells in the outyears)	$0	$307,721	$46,158	$30,772	**$384,651**	$0	**$384,651**	$57,698	$38,465	**$480,814**	33%	$158,668	**$639,482**	$127,896	$0
8	Groundwater	well maintenance	367 Drilling & Construction (per foot)	2000	LF	$546	$1,092,000	25	75	25	Monitoring well replacement every 25 years , 20 wells	$0	$1,092,000	$163,800	$109,200	**$1,365,000**	$117,390	**$1,482,390**	$222,359	$148,239	**$1,852,988**	26%	$481,777	**$2,334,764**	$466,953	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	25	75	25	decommission 20 wells for replacement	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
8	Groundwater	well maintenance	359 Decommission deep well	20	LS	$3,500	$70,000	75	75	1	final decommission of 20 wells	$0	$70,000	$10,500	$7,000	**$87,500**	$7,525	**$95,025**	$14,254	$9,503	**$118,781**	33%	$39,198	**$157,979**	$31,596	$0
8	Groundwater	well maintenance	370 Geologists/Geophysicists/Hydro - S030	200.00	HR	$103	$20,618	25	75	25	Monitoring well replacement every 25 years, 20 wells, assume 1 hr per 10 LF for geologist.	$0	$20,618	$3,093	$2,062	**$25,773**	$2,216	**$27,989**	$4,198	$2,799	**$34,986**	45%	$15,744	**$50,730**	$10,146	$0
8	Groundwater	well maintenance	371 Dispose of drill cuttings	261.92	ton	$83	$21,740	25	75	25	Monitoring well replacement every 25 years (5deep (200) + 5 shallow (100) + 10 deep (200)).	$0	$21,740	$3,261	$2,174	**$27,174**	$2,337	**$29,511**	$4,427	$2,951	**$36,889**	45%	$16,600	**$53,489**	$10,698	$0

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Appendix C

Line Item Detail

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C1 Introduction

Capital, operation and maintenance (O&M), and labor crew groups used in the estimate are provided in this appendix.

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Table C-1. Capital Unit Cost Summary

Location:	100-BC-1, 100-BC-2, 100-BC-5
Phase:	RI/FS
Base Year:	2016
Date:	10/25/2016

	Item	Qty	Unit Cost	Units	Total	Source	Institutional Control?	Add OH and Profit?	Labor Only?	% of non-labor item to be taxed	Notes/References
	MOBILIZATION/DEMOBILIZATION; TEMPORARY UTILTIES AND FACILITIES: #1 - 49										
5	OPERATOR GROUP VIII	76,987.89	$70	HR	$ 5,385,585		NO	YES	NO	100%	Direct labor rate
10	Drilling Mobilization, completion, cleanup and demob	53.00	$ 36,250.00	per well	$ 1,921,250	OTHER	NO	YES	NO	100%	subcontract 56189 Release 1 (stainless steel well)
11	Drilling & Construction (per foot)	6,000.00	$ 546.00	LF	$ 3,276,000	OTHER	NO	YES	NO	100%	subcontract 56189 Release 1 (stainless steel well)
17	Freight for HDPE Pipe	148.15	$ 2,500.00	trip	$ 370,370	OTHER	NO	YES	NO	100%	expect each load to be 54 pieces of 20 ft length, $2500/trip
28	3" x 20 ft. SDR11 HDPE Pipe (High Density Polyethylene Pipe)	30,000.00	$ 3.28	LF	$ 98,400	OTHER	NO	YES	NO	100%	https://www.dultmeier.com/products/0.1158.1916/4444
29	8" x 20 ft. SDR17 HDPE Pipe (High Density Polyethylene Pipe)	110,000.00	$ 10.75	LF	$ 1,182,500	OTHER	NO	YES	NO	100%	https://www.dultmeier.com/products/search/4449
30	McElroy Fusion Machine	67.50	$ 225.00	WK	$ 15,188	OTHER	NO	YES	NO	100%	http://www.hdpesupply.com/butt-fusion-machines-and-tools/
	SITE WORK: #50-99										
50	Globe Valve 3"	33.00	$ 1,279.80	EA	$ 42,233	OTHER	NO	YES	NO	100%	wk. pkg. no/supp: NA 1400004542
51	Cable, 4/C #2 Type W	139,500.00	$ 1.50	LF	$ 209,250	OTHER	NO	YES	NO	100%	wk. pkg. no./supp: NA 1400004301
	EXCAVATION: #100 - 199										
100	Project Management Crew	1,350.00	$ 386.36	Crew Hr	$ 521,581	OTHER	NO	YES	NO	100%	Built up labor team cost
109		-			$ -		NO	YES	NO	100%	
110	Excavation Crew (#42) Un-contaminated	13,709.99	$ 903.96	Crew Hr	$ 12,393,324	OTHER	NO	YES	NO	100%	Built up labor team cost
111	Excavation Crew (#43) Contaminated	9,533.24	$ 1,223.20	Crew Hr	$ 11,661,052	OTHER	NO	YES	NO	100%	Built up labor team cost
112	DumpTrucks	90.76	$ 6,200.00	MO	$ 562,734		NO	YES	NO	100%	Cat Rental Rate (2016)
113	Excavator (Un-contaminated)	69.00	$ 5,200.00	MO	$ 358,825	OTHER	NO	YES	NO	100%	Cat Rental Rate (2016)
114	Excavator (Contaminated)	64.36	$ 5,200.00	MO	$ 334,646	OTHER	NO	YES	NO	100%	Cat Rental Rate (2016)
118	Fuel - Diesel	3,607.43	$ 3.67	gal	$ 13,239	OTHER	NO	YES	NO	100%	MSA - 2016 rates
119	Fuel Delivery	3,607.43	$ 1.79	gal	$ 6,457	OTHER	NO	YES	NO	100%	MSA - 2016 rates
120	Fuel Charge	1,618.79	$16.40	Hr	$ 26,548	OTHER	NO	YES	NO	100%	Assume efficiency of 3.6 gallons/hr (using 150 HP equipment (http://www.epa.gov/cleandiesel/documents/420b10025.pdf), cost of $4/gallon, and fuel delivery of $2/gallon = $16.4/HR.
121	Sampling Crew (#45)	-	$ 526.13	Crew Hr	$ -	OTHER	NO	YES	NO	100%	Built up labor team cost
122	Samples/Event (Lab analysis for total chromium, hexavalent chromium, and strontium-90)	75.97	$ 165.00	EA	$ 12,534	OTHER	NO	YES	NO	100%	Laboratory analysis cost
133	Backfill and soil cover crew (#46)	13,924.04	$ 1,359.38	Crew Hr	$ 18,928,068	OTHER	NO	YES	NO	100%	Built up labor team cost
134	Front End Loader	205.30	$ 15,500.00	MO	$ 3,182,197		NO	YES	NO	100%	Cat Rental Rate (2016)
137	Water Truck	205.30	$ 6,200.00	MO	$ 1,272,879		NO	YES	NO	100%	Cat Rental Rate (2016)
139	Revegetate area	43.39	$ 5,010.00	Ac	$ 217,359	HISTORICAL	NO	YES	NO	100%	
145	Move water main	4.05	$ 1,200,000.00	LS	$ 4,860,000	OTHER	NO	YES	NO	100%	based on C-7 water main excavation & move
	SEDIMENT/SLUDGE REMOVAL OR CONTAINMENT: #200 - 249										
	GROUNDWATER EXTRACTION/INJECTION OR CONTAINMENT: #250 - 349										
252	Sampling Crew	18.00	$ 437.81	Team/Hr	$ 7,881	OTHER	NO	YES	NO	100%	Harrington 2154434 - Sept 2014
253	Extraction well(s)	4,300.00	$ 535.00	LF	$ 2,300,500	HISTORICAL	NO	YES	NO	100%	from Hanford drilling contracts
254	Injection Well(s)	4,000.00	$ 535.00	LF	$ 2,140,000	HISTORICAL	NO	YES	NO	100%	from Hanford drilling contracts
260	Fiber-optic cable and interfaces	50,000.00	$ 1.33	FT	$ 66,500	OTHER	NO	YES	NO	100%	DOW Corning 006E8F-31131-A1
261	100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (labor)	6.25	$ 1,593,940.00	LS	$ 9,962,125	OTHER	NO	YES	YES		100KX pump & treat expansion - labor cost built up and historical
262	100-KW Expansion to handle 100-BC Cr & Sr pump and treatment (material & subcontract)	6.25	$ 2,343,434.00	LS	$ 14,646,463	OTHER	NO	YES	NO	100%	100KX pump & treat expansion - material and subcontract cost built up and historical
264	Transfer Station (injection station)	5.00	$ 805,196.06	LS	$ 4,025,980	HISTORICAL	NO	YES	NO	100%	furniture (36896 R36 FFS $718,660) escalated to 2015
265	Transfer Station (extraction station)	5.00	$ 805,196.06	LS	$ 4,025,980	HISTORICAL	NO	YES	NO	100%	furniture (36896 R36 FFS $718,660) escalated to 2015
266	#10/4C THHN (tray cable)	4,300.00	$ 1.52	LF	$ 6,536	OTHER	NO	YES	NO	100%	Wire & cable to Go 5/19/15 quote
268	Water Level Sensor	33.00	$ 1,200.00	EA	$ 39,600	OTHER	NO	YES	NO	100%	allowance
271	Riser Pipe	8,300.00	$ 49.54	LF	$ 411,182	OTHER	NO	YES	NO	100%	Grainger, Item 4TNL9
275	Pump Assembly	33.00	$ 3,200.00	EA	$ 105,600	OTHER	NO	YES	NO	100%	Grundfos 25C50-26 $3200/ea
279	Disconnect Boxes	33.00	$ 400.00	EA	$ 13,200	OTHER	NO	YES	NO	100%	place holder for disconnect
280	Allowance for Electrical Hookups	5.00	$ 228.00	EA	$ 1,140	OTHER	NO	YES	NO	100%	allowance (10% of cost of cable)
283	Injection Rack	20.00	$ 40,000.00	EA	$ 800,000	HISTORICAL	NO	YES	NO	100%	From Hanford site projects
284	Extraction rack	33.00	$ 150,000.00	EA	$ 4,950,000	HISTORICAL	NO	YES	NO	100%	From Hanford site projects
285	Pump Setting Crew	530.00	$ 528.64	Team/Hr	$ 280,177	OTHER	NO	YES	NO	100%	see pump setting crew list and hours in crewlist tab
289	Landing Plate	53.00	$ 350.00	EA	$ 18,550	OTHER	NO	YES	NO	100%	NA1100008921, 2/8/12 Rod Wordiman, Glen Cronister
291	10000 Gallon Norwesco Plastic Potable Water Storage Tank	5.00	$ 5,870.00	EA	$ 29,350	OTHER	NO	YES	NO	100%	http://www.plastic-mart.com/product/5265/10000-gallon-water-tank
292	SDR17 HDPE Pipe (High Density Polyethylene Pipe), 4" Size ("3.97" I.D.) x **20 ft., †MAX PSI 100 @ 73 Deg. F (PRICE IS PER FOOT. ONLY SOLD IN 20 FT. LENGTHS)	20,000.00	$ 3.28	LF	$ 65,600	OTHER	NO	YES	NO	100%	https://www.dultmeier.com/products/0.1158.1916/4445
293	Fiber Optic Splice Box	20.00	$ 1,000.00	EA	$ 20,000	OTHER	NO	YES	NO	100%	Allowance
294	Geologists/Geophysicists/Hydro - S030	1,430.00	$ 103.09	HR	$ 147,419	OTHER	NO	YES	NO	100%	CHPRC labor rate 2016
295	Dispose of drill cuttings	1,057.93	$ 83.00	ton	$ 87,808		NO	YES	NO	100%	2016 ERDF disposal cost WG
296	pH Adjustment	5.00	$610,000	EA	$ 3,050,000		NO	YES	NO	100%	Based on cost of $607,836 cost for 100-HR-3
	GROUNDWATER PUMP AND TREAT SYSTEMS: #350 - 449										
	SURFACE WATER COLLECTION OR CONTAINMENT: #450- 499										
	IN-SITU TREATMENT SYSTEMS: #500 - 549										
	apatite Injection (alt 6)										
500	Mobilize & Reburbish Skids	1.00	$ 34,890.72	LS	$ 34,891	OTHER	NO	YES	NO	100%	based on contract #39790
501	Sampling Support	1.00	$ 32,936,750.95	LS	$ 32,936,751	OTHER	NO	YES	NO	100%	based on contract #39790
502	Shallow Temp Wells Installation	1.00	$ 76,480,595.07	LS	$ 76,480,595	OTHER	NO	YES	NO	100%	based on contract #39790
503	Demobilize	1.00	$ 89,835.96	LS	$ 89,836	OTHER	NO	YES	NO	100%	based on contract #39790
	ISR (alts 5,6, & 7)										
507	Mobilize & Reburbish Skids	3.00	$ 34,890.72	LS	$ 104,672	OTHER	NO	YES	NO	100%	based on invoice 7039607 & contract #39790
508	Sampling Support	3.00	$ 105,243.25	LS	$ 315,730	OTHER	NO	YES	NO	100%	based on invoice 7039607 & contract #39790
509	Install Injection System and Inject	3.00	$ 255,298.89	LS	$ 765,897	OTHER	NO	YES	NO	100%	based on invoice 7039607 & contract #39790
510	Demobilize	3.00	$ 24,335.92	LS	$ 73,008	OTHER	NO	YES	NO	100%	based on invoice 7039607 & contract #39790
511	Drilling	4.00	$ 218,780.00	LS	$ 875,120	OTHER	NO	YES	NO	100%	based on invoice 7039607 & contract #39790
	ON-SITE TREATMENT SYSTEMS: #550 - 599										
	CAP, COVER, PLUG, AND STABILIZE: #600 - 649										
	MONITORING, TESTING, SAMPLING AND ANALYSIS: #650 - 749										
659	ERDF Disposal Soil Cost ($/Sample)	535.01	$ 497.00	EA	$ 265,900	HISTORICAL	NO	YES	NO	100%	ERQA Unit Cost
	DECONTAMINATION: #750 - 799										
	DEMOLITION AND REMOVAL: #800 - 849										
811	ERDF WG	630,511.78	$ 83.00	Ton	$ 52,332,478	OTHER	NO	YES	NO	100%	ERDF Waste Rates 9/30/2015
818	Survey ERDF Roll-Offs Before ERDF	10,521.57	$ 231.80	Crew Hr	$ 2,438,899	OTHER	NO	YES	YES	100%	crew hour 2 - T050 per hour
819	Survey Tent	9.05	$ 120,000.00	LS	$ 1,086,000	OTHER	NO	YES	NO	100%	allowance
	OFFSITE TREATMENT/DISPOSAL: #850 - 899										
	CAT/ATP/OTP: #900 - 949										
	INSTITUTIONAL CONTROLS: #950 - 999										
	RESERVED: #1000 - 1049										
	RESERVED FOR PROJECT-SPECIFIC UNIT COSTS: #1050 - 1999										
1050	Pipe Fusion Crew (includes testing)	2,700.00	$ 907.26	team hr	$ 2,449,594	OTHER	NO	YES	NO	100%	

Table C-2. O&M Unit Cost Summary

Location:	100-BC-1, 100-BC-2, 100-BC-5
Phase:	RI/FS
Base Year:	2016
Date:	10/25/2016

	Item	Qty	Unit Cost	Units	Total	Source	Institutional Control?	Add OH and Profit?	Labor Only?	% of non-labor item to be taxed	Notes/References
	MONITORING, TESTING, SAMPLING & ANALYSIS: #1 - 199										
2	Sampling Crew	3,564.00	$ 437.81	team/hr	$ 1,560,367	OTHER	NO	YES	NO	100%	Built up labor cost
17	Lab analysis GW - total chromium, hexavalent chromium, and strontium-90	816.00	$ 165.00	EA	$ 134,640	OTHER	NO	YES	NO	100%	SW research lab ICP/MS Metals (1 to 3 metals), Chromium, Strontium
19	Samples/Event Lab analysis for strontium-90 only.	372.00	$ 113.00	EA	$ 42,036	OTHER	NO	YES	NO	100%	
20	Lab analysis GW - total chromium, hexavalent chrominum	372.00	$ 22.00	EA	$ 8,184	OTHER	NO	YES	NO	100%	Test America - Chromium
21	Tritium - Low Level (water)	234.00	$ 90.00	EA	$ 21,060	OTHER	NO	YES	NO	100%	Test America - Chromium
	ABOVE GROUND TREATMENT SYSTEMS: #200 - 299										
	INSITU TREATMENT SYSTEMS: #300 - 349										
	GROUNDWATER EXTRACTION/INJECTION OR CONTAINMENT: #350 - 549										
350	Pump, submersible, 6in dia with 3 in discharge, 15 HP, 480 VAC	53.00	$ 4,499.00	EA	$ 238,447	OTHER	NO	YES	NO	100%	MFG: Grundfos, model number 150S150-7, Cat/Pcard ID: 0000668709. Unattached 3 phase Franklin motor P/N 236-613-4020 items is UL Recognized
351	Well Maintenance Crew	1,450.00	$ 1,538.60	Team/Hr	$ 2,230,975	OTHER	NO	YES	YES	100%	
355	100KX resin cost	1,036,800,000.00	$ 0.00080	per gal	$ 829,440	OTHER	NO	YES	NO	100%	
356	100 KX Pump & Treat Operating Cost	5.00	$ 129,523.81	per year	$ 647,619	OTHER	NO	YES	NO	100%	based on 100KX 2016 average cost at 840 gpm and 100-BC-5 @ 400gpm capacity
357	Decommission shallow well	82.00	$ 2,500.00	LS	$ 205,000	OTHER	NO	YES	NO	100%	allowance
359	Decommission deep well	260.00	$ 3,500.00	LS	$ 910,000	OTHER	NO	YES	NO	100%	allowance
365	Pump Setting Crew	306.00	$ 528.64	Crew Hr	$ 161,762	OTHER	NO	YES	NO	100%	team hour for pump repacement
367	Drilling & Construction (per foot)	20,300.00	$ 546.00	LF	$ 11,083,800	OTHER	NO	YES	NO	100%	subcontract 56189 Release 1
368	Grundfos MW Pump - 10 gpm, 2" pump	100.00	$ 1,500.00	EA	$ 150,000	HISTORICAL	NO	YES	NO	100%	NA160000044, December 1, 2015 contract
370	Geologists/Geophysicists/Hydro - S030	2,030.00	$ 103.09	HR	$ 209,273	OTHER	NO	YES	NO	100%	CHPRC labor rate 2016
371	Dispose of drill cuttings	2,319.88	$ 83.00	ton	$ 192,550	OTHER	NO	YES	NO	100%	2016 ERDF disposal cost WG
374	Annual maintenance cost for P&T system 100K	2,200.00	$ 2,187.00	gpm	$ 4,811,400	OTHER	NO	YES	NO	100%	Discussion of P&T PM-CM against rated capacity Based on Invoce Summaries (Handi)
375	100-KW refurbishment	2.00	$ 984,343.50	EA	$ 1,968,687		NO	YES	NO	100%	Unit cost is 25% of capital unit cost for 100-KW expansion material, labor, and subcontract cost
376	100-KW piping refurbishment	2.00	$ 12,390.00	EA	$ 24,780		NO	YES	NO	100%	Unit cost is 10% of piping cost
	INSTITUTIONAL CONTROLS: #850 - 899										
850	No dig/drilling institutional control	133.00	$ 5,978.00	EA	$ 795,074	RACER	YES	NO	NO	100%	
851	No irrigation institutional control	9.00	$ 5,978.00	EA	$ 53,802	RACER	YES	NO	NO	100%	
	PROGRESS REVIEWS AND REPORTS: #900 - 949										
	SITE CLOSEOUT AND FINAL REPORTS: #950 - 999										
950	Site closeout report - Low	136.00	$ 19,642.00	EA	$ 2,671,312		NO	NO	NO	100%	2010, Steve Ferries

Table C-3. Crew Lists

7	Pipe Fusion Crew (includes testing)			
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
C081	2	Pipefitters	$ 71.57	$ 143.14
M010	1	First Line Supervisors	$ 91.73	$ 91.73
L070	1	Light Vehicle Drivers	$ 78.65	$ 78.65
HSSA-TD08-R	1	TEAMSTER GROUP VIII	$ 50.23	$ 50.23
HSSA-LA09-R	2	LABORER GROUP IX	$ 62.38	$ 124.77
1-21	RSM 01.54.33.2600 daily rent 103.00	genset rental	$ 12.88	$ 12.88
1-21	RSM 01.54.33.2600 hourly use 121.55	genset fuel	$ 15.19	$ 15.19
1-21	RSM 01.54.33.2040 daily rental 247.00	offroad forklift operating	$ 30.88	$ 30.88
1-21	Sunbelt 056-510 hourly = 15.30	offroad forklift rental	$ 1.91	$ 1.91
1-21	RSM 01.54.33.3600 daily rental 98.50	Lighting plant rental	$ 12.31	$ 12.31
1-21	RSM 01.54.33.3600 hourly use : 4.45	lighting plant hourly operating	$ 0.56	$ 0.56
1-21	2.00 per hour (Allowance)	small tools, gloves, blades, bottled water, etc.	$ 0.25	$ 0.25
C081	0.1	Pipefitters	$ 71.57	$ 7.16
M010	0.1	First Line Supervisors	$ 91.73	$ 9.17
HSSA-LA09-R	0.1	LABORER GROUP IX	$ 62.38	$ 6.24
Truck	40	fuel & maintenance per mile	$ 1.19	$ 47.60
truck rental	2	1 ton truck per hour	$ 31.50	$ 63.00
R032	1	Equip Operator-Crane	$ 76.83	$ 76.83
Crane	1	Crane Equip (HE12) 20-250 ton	$ 127.51	$ 127.51
Truck	6.1	fuel & maintenance per mile	$ 1.19	$ 7.26
8.3 Team Hrs	**Pipe Fusion Crew (includes testing)**			**$ 907**

10	Pump Setting Crew			
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
T110	2	Other Technicians	$ 67.01	$ 134.02
M010	0.3	First Line Supervisors	$ 91.73	$ 27.52
S030	0.3	Geologists/Geophysicists/Hydro	$ 101.73	$ 30.52
P070	0.3	Planner/Scheduler/Estimators	$ 83.13	$ 24.94
R051	0.3	Nuclear Wst Process Oper (NCO)	$ 76.63	$ 22.99
T050	0.3	Health Physics Technicians	$ 72.50	$ 21.75
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	1	1 ton truck per hour	$ 31.50	$ 31.50
R032	1	Equip Operator-Crane	$ 76.83	$ 76.83
Crane	1	Crane Equip (HE12) 20-250 ton	$ 127.51	$ 127.51
Truck	6.1	fuel & maintenance per mile	$ 1.19	$ 7.26
4.5 Team Hrs	**Pump Setting Crew**			**$ 529**

11	Well Maintenance Crew			
FOLLOWING CP264-1900-FY18 WELL MAINTENANCE FOR EXTRACTION WELLS				
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
C121	0.1	Other Crafts-Insulators	$ 71.03	$ 7.10
E110	0.5	Quality Control Engineers	$ 93.47	$ 46.74
M010	1	First Line Supervisors	$ 91.73	$ 91.73
M010	0.5	First Line Supervisors	$ 91.73	$ 45.87
R051	1	Nuclear Wst Process Oper (NCO)	$ 76.63	$ 76.63
R051	1	Nuclear Wst Process Oper (NCO)	$ 76.63	$ 76.63
S020	1.8	Environmental Scientists	$ 88.36	$ 159.05
S020	1	Environmental Scientists	$ 88.36	$ 88.36
S020	3	Environmental Scientists	$ 88.36	$ 265.08
T050	1	Health Physics Technicians	$ 72.50	$ 72.50
T050	1	Health Physics Technicians	$ 72.50	$ 72.50
T060	1	Industrial Health/Safety Tech	$ 71.81	$ 71.81
T070	0.3	Instrument & Control Techs	$ 76.00	$ 22.80
HSSA-TD08-R	0.5	TEAMSTER GROUP VIII	$ 50.23	$ 25.11
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	1	1 ton truck per hour	$ 31.50	$ 31.50
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	4	1 ton truck per hour	$ 31.50	$ 126.00
R032	1	Equip Operator-Crane	$ 76.83	$ 76.83
Crane	1	Crane Equip (HE12) 20-250 ton	$ 127.51	$ 127.51
Truck	6.1	fuel & maintenance per mile	$ 1.19	$ 7.26
13.7 Team Hrs	**Well Maintenance Crew**			**$ 1,539**

14	Sampling Crew			
● Samples per SAP ● Generate survey maps ● Sample documentation ● water disposal ● Truck				
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
M010	0.3	First Line Supervisors	$ 91.73	$ 27.52
R051	2	Nuclear Wst Process Oper (NCO)	$ 76.63	$ 153.26
S020	0.3	Environmental Scientists	$ 88.36	$ 26.51
C020	0	Electricians	$ 75.54	$ -
HSSA-TD08-R	1	TEAMSTER GROUP VIII	$ 50.23	$ 50.23
disposal	125	water disposal	$ 1.00	$ 125.00
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	1	1 ton truck per hour	$ 31.50	$ 31.50
148.6	**Sampling Crew**			**$ 438**

17	Survey ERDF Roll-Offs Before ERDF			
T050 rad tech - to survey the rolloff boxes, assume 50 ERDF boxes a day				
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
T050	2	Health Physics Technicians	$ 72.50	$ 145.00
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	2	1 ton truck per hour	$ 31.50	$ 63.00
				$ -
				$ -
2 Team Hrs	**Design Crew**			**$ 232**

20	Survey Crew - General			
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
E020	1	Civil Engineers	$ 120.27	$ 120.27
T030	2	Engineering Technicians	$ 61.65	$ 123.30
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	2	1 ton truck per hour	$ 31.50	$ 63.00
3 Team Hrs	**Design Crew**			**$ 330**

21	Survey Crew - Cultural			
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
E020	1	Civil Engineers	$ 120.27	$ 120.27
S030	1	Geologists/Geophysicists/Hydro	$ 101.73	$ 101.73
T030	2	Engineering Technicians	$ 61.65	$ 123.30
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	2	1 ton truck per hour	$ 31.50	$ 63.00
4 Team Hrs	**Design Crew**			**$ 432**

42	Excavation Crew Un-Contaminated			
● Stabilize waste site				
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
HSSA-LA09-R	2 – Teamster	LABORER GROUP IX	$ 62.38	$ 124.77
M010	0.5 – FWS	First Line Supervisors	$ 91.73	$ 45.87
M010	0.5 - RC FLS	First Line Supervisors	$ 91.73	$ 45.87
R032	1 - HEO	Equip Operator-Crane	$ 76.83	$ 76.83
R032	2 - Crane Operator	Equip Operator-Crane	$ 76.83	$ 153.66
R052	3 - D&D	Nuclear Wst Process Oper (D&D)	$ 52.59	$ 157.77
T050	2 - RCT	Health Physics Technicians	$ 72.50	$ 145.00
T060	0.5 - IH/IS	Industrial Health/Safety Tech	$ 71.81	$ 35.91
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	3	1 ton truck per hour	$ 31.50	$ 94.50
11.5 FTE	**Excavation Crew Un-Contaminated**			**$ 904**

43	Excavation Crew Contaminated			
● Dig soil				
COCS	**PER CREW HOUR**	**COCS TITLE**	**RATE**	**EXTENDED**
E010	1 - Load Mgmt Engr	Chemical Engineers	$ 98.88	$ 98.88
E110	0.5 - QC	Quality Control Engineers	$ 93.47	$ 46.74
HSSA-LA09-R	1 – Teamster	LABORER GROUP IX	$ 62.38	$ 62.38
M010	1 - FWS	First Line Supervisors	$ 91.73	$ 91.73
M010	0.5 - RC FLS	First Line Supervisors	$ 91.73	$ 45.87
P170	1 - Waste Verifier	Other Professionals	$ 94.09	$ 94.09
R032	0.5 - HEO	Equip Operator-Crane	$ 76.83	$ 38.42
R032	1 - Crane Operator	Equip Operator-Crane	$ 76.83	$ 76.83
R052	4 - D&D	Nuclear Wst Process Oper (D&D)	$ 52.59	$ 210.36
S090	1 - NDA Support	Other Scientists	$ 91.30	$ 91.30
T050	2 - RCT	Health Physics Technicians	$ 72.50	$ 145.00
T060	1 - IH/IS	Industrial Health/Safety Tech	$ 71.81	$ 71.81
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	4	1 ton truck per hour	$ 31.50	$ 126.00
14.5 FTE	**Excavation Crew Contaminated**			**$ 1,223**

44	Ship to ERDF			
● Waste Management Representatives				
COCS	PER CREW HOUR	COCS TITLE	RATE	EXTENDED
HSSA-LA09-R	6 – Teamster	LABORER GROUP IX	$ 62.38	$ 374.30
M010	0.5 – FWS	First Line Supervisors	$ 91.73	$ 45.87
M010	0.5 - RC FLS	First Line Supervisors	$ 91.73	$ 45.87
P170	1 - shipper	Other Professionals	$ 94.09	$ 94.09
P170	2 - waste management rep	Other Professionals	$ 94.09	$ 188.18
R052	3 - D&D	Nuclear Wst Process Oper (D&D)	$ 52.59	$ 157.77
T050	2 - RCT	Health Physics Technicians	$ 72.50	$ 145.00
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	4	1 ton truck per hour	$ 31.50	$ 126.00
R032	1 - Crane Operator	Equip Operator-Crane	$ 76.83	$ 76.83
Crane	1	Crane Equip (HE12) 20-250 ton	$ 127.51	$ 127.51
Truck	6.1	fuel & maintenance per mile	$ 1.19	$ 7.26
15 FTE	**Ship to ERDF**			**$ 1,412**

45	Sampling Crew			
● Radiological field screening				
COCS	PER CREW HOUR	COCS TITLE	RATE	EXTENDED
M010	1 – FWS	First Line Supervisors	$ 91.73	$ 91.73
R052	1 – Mobile Sampler D&D	Nuclear Wst Process Oper (D&D)	$ 52.59	$ 52.59
S020	1 – Env. Scientist	Environmental Scientists	$ 88.36	$ 88.36
T030	1 – Surveyor	Engineering Technicians	$ 61.65	$ 61.65
T050	2 – HPT	Health Physics Technicians	$ 72.50	$ 145.00
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	2	1 ton truck per hour	$ 31.50	$ 63.00
6 FTE	**Sampling Crew**			**$ 526**

46	Backfill and soil cover crew			
● Confirm sample results				
COCS	PER CREW HOUR	COCS TITLE	RATE	EXTENDED
HSSA-LA09-R	6 – Teamster	LABORER GROUP IX	$ 62.38	$ 374.30
HSSA-LA09-R	1.5 – Teamster/Spray Crew	LABORER GROUP IX	$ 62.38	$ 93.58
M010	1 - FWS	First Line Supervisors	$ 91.73	$ 91.73
R032	2 - HEO	Equip Operator-Crane	$ 76.83	$ 153.66
R052	5 - D&D	Nuclear Wst Process Oper (D&D)	$ 52.59	$ 262.95
S020	1 – Env. Scientist	Environmental Scientists	$ 88.36	$ 88.36
T050	2 - RCT	Health Physics Technicians	$ 72.50	$ 145.00
Truck	20	fuel & maintenance per mile	$ 1.19	$ 23.80
truck rental	4	1 ton truck per hour	$ 31.50	$ 126.00
18.5 FTE	**Backfill and soil cover crew**			**$ 1,359**

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Appendix D

Institutional Controls

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D1 Introduction

Information regarding the remedy-specific institutional controls (ICs) expected within each remedy alternative is provided in this appendix.

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Table D-1. Remedy Components for Remedial Action Alternatives

Waste Site Identification and Type or Groundwater Source/Plume	Description	Basis for Remedial Action and COCs (Estimated Date Decay Achieves PRG)				Alternatives						Comments
		Shallow Soil >Direct Contact Human Health PRG	Deep Soil Rad >Direct Contact Human Health PRG[b]	Soil >Groundwater/ Surface Water Protection SSL	Soil >Groundwater/ Surface Water Protection PRG	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	
100-B-34 Radioactive Process Sewerc	Residual segments from other pipeline waste sites that could not be remediated due to the presence of overlying active utilities. 1) Eastern location consists of two segments of the former reactor cooling water effluent sewers from the 105-C Reactor. Two 15 m (50 ft) long segments of the parallel 1.5 m (60 in.) pipelines were left in place where they traversed beneath the active export water pipeline (the primary water supply for the 200 Area). 2) Western location consists of a single segment of the sodium dichromate transfer line from the 183-C facility to the 183-B facility. This is a 17 m (55 ft) long segment of 10 cm (4 in.) pipe. This segment is located 1.8 m (4 ft) bgs, beneath the fire suppression loop for remaining 100-BC facilities. Sodium dichromate liquid within this segment was displaced and collected using grout.	Eastern segments: Cs-137, Eu-152, Sr-90 (Year 2055)[a] Western segement: Cr(VI) (indefinite timeframe)[a]	Eastern segments: Cs-137, Eu-152, Sr-90 (Year 2055)[a]	Western segment: Cr(VI) (indefinite timeframe)[a]	Western segment: Cr(VI) (indefinite timeframe)[a]	Eastern segments: Natural attenuation with ICs (shallow and deep excavation restrictions) Western segment: RTD to 2.7 m (9 ft)	Eastern segments: Natural attenuation with ICs (shallow and deep excavation restrictions) Western segment: RTD to 2.7 m (9 ft)	Eastern segments: Reroute water lines, RTD to 4.6 m (15 ft), and remove pipeline segments, ICs (deep excavation restrictions) Western segment: RTD to 2.7 m (9 ft)	Eastern segments: Natural attenuation with ICs (shallow excavation restrictions), Western segment: RTD to 2.7 m (9 ft)	Eastern segments: Reroute water lines and RTD to 4.6 m (15 ft), and remove pipeline segments, ICs (deep excavation restrictions) Western segments: RTD to 2.7 m (9 ft)	Eastern segments: Reroute water lines, RTD to 4.6 m (15 ft), and remove pipeline segments, ICs (deep excavation restrictions) Westerm segment: RTD to 2.7 m (9 ft)	Approximate depth to bottom of the 60-in. diameter reactor cooling water effluent pipeline segments is from 4.6 m (15 ft) to 5.5 m (18 ft). Because the pipeline was pressurized, it is assumed that contaminantion may occur in the shallow and deep soil surrounding the entire pipe diameter and as scale inside the pipe. Alternatives 4, 6, and 7 assume soil RTD to 4.6 m (15 ft) with removal of the two pipeline segments. Approximate maximum depth to bottom of sodium dichromate pipeline segments is 2.1 m (7 ft). Alternatives 2 through 7 assume removal of the pipeline segment and soil RTD to 2.7 m (9 ft). Excavation procedures need to consider overlying utilities, which include the export water line main to the Central Plateau (42 in. diameter, top of pipe 1.8 m [6 ft] bgs) and fire suppression system line (10 in. diameter, top of pipe 1.2 m [4 ft] bgs).
116-C-1 Trench	Former process effluent disposal trench. Received contaminated cooling water throughout operations. Includes 700 million L (184 million gal) from the 100-B/C Area Retention Basins after ruptured fuel elements were detected in the reactors. Received 40 billion L (more than 10 billion gal) of high-temperature reactor cooling water during a 150-day infiltration test in 1967.	---	Cs-137, Eu-152, Eu-154, Co-60, Ni-63, Sr-90 (Year 2485)	Sr-90 (Year 2034)	---	Natural attenuation with ICs (irrigation and deep excavation restrictions)	Natural attenuation with ICs (irrigation and deep excavation restrictions)	Deep RTD to 12 m (42 ft)	Natural attenuation with ICs (irrigation and deep excavation restrictions)	Deep RTD to 12 m (42 ft)	In situ treatment using Apatite Jet Injection; Natural attenuation with ICs (irrigation and deep excavation restrictions)	For Alternatives 4 and 6, RTD would eliminate the need for ICs restricting excavation and preventing irrigation. Previously remediated site. For Alternative 7, apatite injection target zone includes Treatment Area 1, a 1,025 m^2 (11,025 ft^2) area at inlet (west end) of trench to approximately 12.8 m (42 ft) bgs.

Table D-1. Remedy Components for Remedial Action Alternatives

Waste Site Identification and Type or Groundwater Source/Plume	Description	Basis for Remedial Action and COCs (Estimated Date Decay Achieves PRG)				Alternatives						Comments
		Shallow Soil >Direct Contact Human Health PRG	Deep Soil Rad >Direct Contact Human Health PRG[b]	Soil >Groundwater/ Surface Water Protection SSL	Soil >Groundwater/ Surface Water Protection PRG	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	
118-B-1 Burial Ground	23 burial trenches. Received general reactor waste from the 105-B Reactor and waste materials from the Tritium Separation (P-10) Project.	Sr-90 (Year 2040)	Tritium (Year 2081)	Tritium (Year 2049)	Tritium (Year 2041)	Natural attenuation with ICs (irrigation, shallow and deep excavation restrictions)	Natural attenuation with ICs (irrigation, shallow and deep excavation restrictions)	Natural attenuation with ICs (shallow excavation restriction for Sr-90); deep RTD to 22.5 m (73.8 ft) for tritium	Natural attenuation with ICs (irrigation, shallow and deep excavation restrictions)	Natural attenuation with ICs (shallow excavation restriction for Sr-90); deep RTD to 22.5 m (73.8 ft) for tritium	Natural attenuation with ICs (shallow excavation restriction for Sr-90); deep RTD to 22.5 m (73.8 ft) for tritium	Previously remediated site. Shallow strontium-90 and deep tritium PRG exceedances apply to different areas of the waste site (north versus south, respectively). Although the site specific model forecasts groundwater tritium concentrations will increase and exceed the groundwater PRG until 2049, tritium in downgradient groundwater at well 199-B8-6 does not currently exceed the tritium PRG of 20,000 pCi/L, and concentrations are decreasing.
118-B-8:4 Subsite	New subsite. Adjacent to B Reactor Museum. Exceedances at RI boreholes C7847 (shallow) and C8239 (deep).	Cs-137, Eu-152, Sr-90 (Year 2203)	C-14, Sr-90 (Year 32021)	---	---	Natural attenuation with ICs (shallow and deep excavation restrictions)	Natural attenuation with ICs (shallow and deep excavation restrictions)	RTD to 4.6 m (15 ft): ICs (deep excavation restrictions)	Natural attenuation with ICs (shallow and deep excavation restrictions)	RTD to 4.6 m (15 ft): ICs (deep excavation restrictions)	RTD to 4.6 m (15 ft): ICs (deep excavation restrictions)	Additional administrative and technical considerations for RTD adjacent to fuel storage basin and museum.
116-B-5 Crib	Received liquid waste from 108-B Building P-10 Project.	Eu-152 (Year 2021)	---	---	---	Natural attenuation with ICs (shallow excavation restrictions)	Natural attenuation with ICs (shallow excavation restrictions)	Natural attenuation with ICs (shallow excavation restrictions)	Natural attenuation with ICs (shallow excavation restrictions)	Natural Attenuation with ICs (shallow excavation restrictions)	Natural attenuation with ICs (shallow excavation restrictions)	Approximate total depth of contamination is 4.6 m (15 ft).
116-B-6A/116-B-16 Crib/Tank	The crib received liquid wastes from equipment decontamination performed in the 111-B facility, as well as from the decontamination of fuel element spacers. The tank was a low-level liquid waste disposal site that was operational during the lifetime of the 111-B Metallurgical Examination Building.	Cs-137 Sr-90 (Year 2045)	Sr-90 (Year 2095)	---	---	Natural attenuation with ICs (shallow and deep excavation restrictions)	Natural attenuation with ICs (shallow and deep excavation restrictions)	RTD to 4.6 m (15 ft); ICs (deep excavation restrictions)	Natural attenuation with ICs (shallow and deep excavation restrictions)	RTD to 4.6 m (15 ft); ICs (deep excavation restrictions)	RTD to 4.6 m (15 ft); ICs (deep excavation restrictions)	Previously remediated. Approximate total depth of contamination is 6 m (19.7 ft).
Cr(VI) CSM-PRZ Sources		CSM indicates residual source present in two areas: Area 1 = vicinity of 100-C-7 and 100-C-7:1; Area 2 = vicinity of 116-B-11.				Natural attenuation	Natural attenuation	Natural attenuation	ISR (116-B-11 vicinity), Natural attenuation (100-C-7, 100-C-7:1 vicinity)	ISR (116-B-11 vicinity), Natural attenuation (100-C-7, 100-C-7:1 vicinity)	ISR (116-B-11 vicinity), Natural attionuation (100-C-7, 100-C-7:1 vicinity)	

Table D-1. Remedy Components for Remedial Action Alternatives

Waste Site Identification and Type or Groundwater Source/Plume	Description	Basis for Remedial Action and COCs (Estimated Date Decay Achieves PRG)				Alternatives						Comments
		Shallow Soil >Direct Contact Human Health PRG	Deep Soil Rad >Direct Contact Human Health PRG[b]	Soil >Groundwater/ Surface Water Protection SSL	Soil >Groundwater/ Surface Water Protection PRG	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	
Cr(VI) Groundwater Dissolved Plume		Exceeds Cr(VI) PRGs.				MNA and ICs (groundwater use)	Pump 400 gpm for 40 yr, treat at 100-KW, and reinject at 100-BC	Pump 400 gpm for 40 yr, treat at 100-KW, and reinject at 100-BC	Pump 400 gpm for 15 yr, treat at 100-KW, and reinject at 100-BC	Pump 400 gpm for 15 yr, treat at 1100-KW, and reinject at 100-BC	Pump 400 gpm for 15 yr, treat at 100-KW, and reinject at 100-BC	
Strontium-90 CSM-PRZ Sources		CSM indicates residual sources within the Sr-90 plume footprint, overlying the higher concentration portion of the Sr-90 plume.				Natural attenuation	Natural attenuation	Natural attenuation	Natural attenuation	Natural attenuation	In situ sequestration of Sr-90 using Apatite Jet Injection	For Alternative 7, apatite injection target zone includes Treatment Area 2, a 24,400 m^2 (259,410 ft^2) area overlying the Sr-90 plume to approximately to 12.8 m (42 ft) bgs.
Strontium-90 Groundwater Dissolved Plume		Exceeds Sr-90 PRG.				MNA and ICs (groundwater use)	Pump 400 gpm for 40 years, treat at 100-KW, and reinject at 100-BC; MNA and ICs (groundwater use) for Sr-90 after P&T shutdown	Pump 400 gpm for 40 years, treat at 100-KW, and reinject at 100-BC; MNA and ICs (groundwater use) for Sr-90 after P&T shutdown	Pump 400 gpm for 15 years, treat at 100-KW, and reinject at 100-BC; MNA and ICs (groundwater use) for Sr-90 after P&T shutdown	Pump 400 gpm for 15 years, treat at 100-KW, and reinject at 100-BC; MNA and ICs (groundwater use) for Sr-90 after P&T shutdown	Pump 400 gpm for 15 years, treat 100-KW, and reinject at 100-BC; MNA and ICs (groundwater use) for Sr-90 after P&T shutdown	Although some strontium-90 is co-extracted with Cr(VI) P&T, the strontium-90 plume is remediated primarily through natural attenuation (radioactive decay). Sr-90 treatment is not anticipated to be required but would be added if influent concentrations are above 8 pCi/L.

Note: Blue shading indicates remedial action component. Table adapted from Table 9-3 of DOE/RL-2010-96, Draft A.

a. Presumed exceedances based on process knowledge and data for connecting pipeline segments (previously remediated). Indefinite timeframe to meet Cr(VI) PRG.

b. An institutional control to restrict excavation will be applied to sites that meet this condition. No further remedial action alternatives were developed for direct contact PRG exceedances for deep soil.

c. Includes segments of a former radioactive process sewer (waste site 100-C-6:1) and sodium dichromate transfer pipeline (waste site 100-B-28)

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Appendix E

Deep Rough Order of Magnitude Cost Details

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E1 Introduction

This appendix includes costs associated with deep rough order of magnitude (ROM) for 29 waste sites. A summary of costs for the 29 waste sites is included in Table E-1. Table E-2 provides cost mark-up details. Tables E-3 through E-24 provide cost details for each of the 29 waste sites.

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Table E-1. Summary of ROM RTD Costs Per Site

Location:	Deep sites	**Base Year:**	2016
Phase:	ROM	**Date:**	10/25/2016

Site Name		
100-B-5		
	Capital Cost	$21,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$21,000,000
	Total Present Value of Alternative	$21,000,000
100-B-8:1 (100-C-6:1)		
	Capital Cost	$8,400,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$8,400,000
	Total Present Value of Alternative	$8,400,000
100-B-8:2 (100-C-6:2, 100-C-6:3, 100-C-6:4)		
	Capital Cost	$51,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$51,000,000
	Total Present Value of Alternative	$51,000,000
100-B-14:1		
	Capital Cost	$7,400,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$7,400,000
	Total Present Value of Alternative	$7,400,000
100-B-21:4		
	Capital Cost	$5,200,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$5,200,000
	Total Present Value of Alternative	$5,200,000
100-B-34 RAD		
	Capital Cost	$2,600,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$2,600,000
	Total Present Value of Alternative	$2,600,000
116-B-1		
	Capital Cost	$9,500,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$9,500,000
	Total Present Value of Alternative	$9,500,000
116-B-2		
	Capital Cost	$1,400,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$1,400,000
	Total Present Value of Alternative	$1,400,000
116-B-3		
	Capital Cost	$530,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$530,000
	Total Present Value of Alternative	$530,000

Table E-1. Summary of ROM RTD Costs Per Site

Location:	Deep sites	**Base Year:**	2016
Phase:	ROM	**Date:**	10/25/2016

Site Name		
116-B-4		
	Capital Cost	$1,800,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$1,800,000
	Total Present Value of Alternative	$1,800,000
116-B-6A/116-B-16		
	Capital Cost	$1,900,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$1,900,000
	Total Present Value of Alternative	$1,900,000
116-B-11		
	Capital Cost	$26,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$26,000,000
	Total Present Value of Alternative	$26,000,000
116-B-14		
	Capital Cost	$990,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$990,000
	Total Present Value of Alternative	$990,000
116-C-1		
	Capital Cost	$70,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$70,000,000
	Total Present Value of Alternative	$70,000,000
116-C-2A (116-C-2B, 116-C-2C)		
	Capital Cost	$5,400,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$5,400,000
	Total Present Value of Alternative	$5,400,000
116-C-3		
	Capital Cost	$910,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$910,000
	Total Present Value of Alternative	$910,000
116-C-5		
	Capital Cost	$38,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$38,000,000
	Total Present Value of Alternative	$38,000,000
118-B-1		
	Capital Cost	$89,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$89,000,000
	Total Present Value of Alternative	$89,000,000

Table E-1. Summary of ROM RTD Costs Per Site

Location:	Deep sites	**Base Year:**	2016
Phase:	ROM	**Date:**	10/25/2016

Site Name		
118-B-6		
	Capital Cost	$4,400,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$4,400,000
	Total Present Value of Alternative	$4,400,000
118-B-8:4		
	Capital Cost	$40,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$40,000,000
	Total Present Value of Alternative	$40,000,000
118-C-1		
	Capital Cost	$3,700,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$3,700,000
	Total Present Value of Alternative	$3,700,000
118-C-3:2		
	Capital Cost	$9,400,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$9,400,000
	Total Present Value of Alternative	$9,400,000
	Capital Cost	$400,000,000
	Annual O&M Cost	$0
	Periodic O&M Cost	$0
	Total Non-Discounted Cost	$400,000,000
	Total Present Value of Alternative	$400,000,000

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Table E-2. Deep ROM Cost Mark-Up Details

Deep RTD ROM

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Location: Deep sites **Base Year: 2016**
Phase: ROM **Date: 10/25/2016**

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CAPITAL COSTS		CAPITAL MARKUPS														
		Overhead	Profit		WA States Sales Tax		Scope Contingency	Bid Contingency		Project Management	Remedial Design	Construction Management		CHPRC G&A	TOTAL
SITE NAME	COST	15%	10%	SUBTOTAL	8.3%	SUBTOTAL	15%	10%	SUBTOTAL	5%	6%	6%	SUBTOTAL	20.00%	COST
100-B-5	$8,706,611	$1,305,992	$870,661	**$10,883,263**	$903,311	**$11,786,574**	$1,767,986	$1,178,657	**$14,733,218**	$736,661	$883,993	$883,993	**$17,237,865**	$3,447,573	**$20,685,437**
100-B-8:1 (100-C-6:1)	$3,539,608	$530,941	$353,961	**$4,424,510**	$367,234	**$4,791,744**	$718,762	$479,174	**$5,989,680**	$299,484	$359,381	$359,381	**$7,007,926**	$1,401,585	**$8,409,511**
100-B-8:2 (100-C-6:2, 100-C-6:3, 100-C-6:4)	$21,617,016	$3,242,552	$2,161,702	**$27,021,270**	$2,242,765	**$29,264,036**	$4,389,605	$2,926,404	**$36,580,045**	$1,829,002	$2,194,803	$2,194,803	**$42,798,652**	$8,559,730	**$51,358,383**
100-B-14:1	$3,103,833	$465,575	$310,383	**$3,879,792**	$322,023	**$4,201,815**	$630,272	$420,181	**$5,252,268**	$262,613	$315,136	$315,136	**$6,145,154**	$1,229,031	**$7,374,185**
100-B-21:4	$2,168,544	$325,282	$216,854	**$2,710,680**	$224,986	**$2,935,667**	$440,350	$293,567	**$3,669,584**	$183,479	$220,175	$220,175	**$4,293,413**	$858,683	**$5,152,096**
100-B-34 RAD	$1,105,313	$165,797	$110,531	**$1,381,641**	$114,676	**$1,496,317**	$224,448	$149,632	**$1,870,397**	$93,520	$112,224	$112,224	**$2,188,364**	$437,673	**$2,626,037**
116-B-1	$4,000,763	$600,114	$400,076	**$5,000,953**	$415,079	**$5,416,032**	$812,405	$541,603	**$6,770,040**	$338,502	$406,202	$406,202	**$7,920,947**	$1,584,189	**$9,505,137**
116-B-2	$584,722	$87,708	$58,472	**$730,903**	$60,665	**$791,568**	$118,735	$79,157	**$989,460**	$49,473	$59,368	$59,368	**$1,157,668**	$231,534	**$1,389,202**
116-B-3	$224,051	$33,608	$22,405	**$280,063**	$23,245	**$303,308**	$45,496	$30,331	**$379,136**	$18,957	$22,748	$22,748	**$443,589**	$88,718	**$532,306**
116-B-4	$769,643	$115,446	$76,964	**$962,054**	$79,850	**$1,041,904**	$156,286	$104,190	**$1,302,381**	$65,119	$78,143	$78,143	**$1,523,785**	$304,757	**$1,828,542**
116-B-6A/116-B-16	$780,084	$117,013	$78,008	**$975,105**	$80,934	**$1,056,039**	$158,406	$105,604	**$1,320,048**	$66,002	$79,203	$79,203	**$1,544,457**	$308,891	**$1,853,348**
116-B-11	$10,945,444	$1,641,817	$1,094,544	**$13,681,805**	$1,135,590	**$14,817,395**	$2,222,609	$1,481,739	**$18,521,743**	$926,087	$1,111,305	$1,111,305	**$21,670,440**	$4,334,088	**$26,004,528**
116-B-14	$416,202	$62,430	$41,620	**$520,253**	$43,181	**$563,434**	$84,515	$56,343	**$704,292**	$35,215	$42,258	$42,258	**$824,022**	$164,804	**$988,827**
116-C-1	$29,357,649	$4,403,647	$2,935,765	**$36,697,061**	$3,045,856	**$39,742,917**	$5,961,438	$3,974,292	**$49,678,647**	$2,483,932	$2,980,719	$2,980,719	**$58,124,017**	$11,624,803	**$69,748,820**
116-C-2A (116-C-2B, 116-C-2C)	$2,266,185	$339,928	$226,619	**$2,832,731**	$235,117	**$3,067,848**	$460,177	$306,785	**$3,834,810**	$191,741	$230,089	$230,089	**$4,486,728**	$897,346	**$5,384,073**
116-C-3	$384,472	$57,671	$38,447	**$480,589**	$39,889	**$520,478**	$78,072	$52,048	**$650,598**	$32,530	$39,036	$39,036	**$761,200**	$152,240	**$913,439**
116-C-5	$15,859,980	$2,378,997	$1,585,998	**$19,824,975**	$1,645,473	**$21,470,448**	$3,220,567	$2,147,045	**$26,838,060**	$1,341,903	$1,610,284	$1,610,284	**$31,400,530**	$6,280,106	**$37,680,636**
118-B-1	$37,493,974	$5,624,096	$3,749,397	**$46,867,468**	$3,890,000	**$50,757,467**	$7,613,620	$5,075,747	**$63,446,834**	$3,172,342	$3,806,810	$3,806,810	**$74,232,796**	$14,846,559	**$89,079,355**
118-B-6	$1,868,131	$280,220	$186,813	**$2,335,163**	$193,819	**$2,528,982**	$379,347	$252,898	**$3,161,227**	$158,061	$189,674	$189,674	**$3,698,636**	$739,727	**$4,438,363**
118-B-8:4	$17,019,205	$2,552,881	$1,701,921	**$21,274,006**	$1,765,743	**$23,039,749**	$3,455,962	$2,303,975	**$28,799,686**	$1,439,984	$1,727,981	$1,727,981	**$33,695,633**	$6,739,127	**$40,434,759**
118-C-1	$1,540,174	$231,026	$154,017	**$1,925,217**	$159,793	**$2,085,010**	$312,752	$208,501	**$2,606,263**	$130,313	$156,376	$156,376	**$3,049,327**	$609,865	**$3,659,193**
118-C-3:2	$3,964,286	$594,643	$396,429	**$4,955,358**	$411,295	**$5,366,652**	$804,998	$536,665	**$6,708,315**	$335,416	$402,499	$402,499	**$7,848,729**	$1,569,746	**$9,418,475**
														Total	**$398,464,651**

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Table E-3. 100-B-5 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	1883	0-Labor
Perform Initial Site Survey	Health Physics Technicians	1372	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	100000	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	138338	0-Labor
Provide Field Support and Supervision	First Line Supervisors	194117	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	430431	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	815226	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	579154	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	4048865	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	1883	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	2744	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	9611	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	52721	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	297	0-Labor
Field Sampling During Excavation	Material & Equipment	1463	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	92392	0-Labor
Field Sampling During Excavation	Health Physics Technicians	86086	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	131934	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	585	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	2790	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	2600	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	68490	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	622211	2-Subcontractors
Haul Borrow from Pit	PO Contracts	472850	2-Subcontractors
Spread and Compact Soil	PO Contracts	767571	2-Subcontractors
Finish Grading Site	PO Contracts	5175	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	1883	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	2744	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	18590	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$8,706,611**	

Table E-4. 100-B-8:1, 100-C-6:1 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	1586	0-Labor
Perform Initial Site Survey	Health Physics Technicians	1156	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	2068	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	2635	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	2455	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	5440	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	54825	2-Subcontractors
Complete Design and Procurement	PO Contracts	51232	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	57563	0-Labor
Provide Field Support and Supervision	First Line Supervisors	91709	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	179106	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	390283	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	195623	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	1367633	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	1586	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	2311	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	4341	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	22533	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	248	0-Labor
Field Sampling During Excavation	Material & Equipment	1268	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	38445	0-Labor
Field Sampling During Excavation	Health Physics Technicians	35821	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	113718	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	423	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	2015	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1878	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	49465	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	297882	2-Subcontractors
Haul Borrow from Pit	PO Contracts	167776	2-Subcontractors
Spread and Compact Soil	PO Contracts	339632	2-Subcontractors
Finish Grading Site	PO Contracts	4392	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	1586	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	2311	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	15891	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$3,539,608**	

Table E-5. 100-B-8:2, 100-C-6:2, 100-C-6:3, 100-C-6:4 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	3369	0-Labor
Perform Initial Site Survey	Health Physics Technicians	2455	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	3041	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	3876	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	3611	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	8000	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	80625	2-Subcontractors
Complete Design and Procurement	PO Contracts	100000	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	306385	0-Labor
Provide Field Support and Supervision	First Line Supervisors	425682	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	953304	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	1359093	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	1653512	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	11559701	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	3369	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	4911	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	21625	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	116708	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	545	0-Labor
Field Sampling During Excavation	Material & Equipment	5363	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	204626	0-Labor
Field Sampling During Excavation	Health Physics Technicians	190661	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	500830	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	1495	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	7131	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	6644	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	175030	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	1037312	2-Subcontractors
Haul Borrow from Pit	PO Contracts	1282110	2-Subcontractors
Spread and Compact Soil	PO Contracts	1514253	2-Subcontractors
Finish Grading Site	PO Contracts	8979	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	3369	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	4911	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	31716	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$21,617,016**	

Table E-6. 100-B-14:1 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	1288	0-Labor
Perform Initial Site Survey	Health Physics Technicians	939	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	1095	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	1395	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	1300	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	2880	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	29025	2-Subcontractors
Complete Design and Procurement	PO Contracts	38764	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	45494	0-Labor
Provide Field Support and Supervision	First Line Supervisors	70310	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	141551	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	224470	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	214747	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	1501346	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	1288	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1878	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	3333	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	17766	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	198	0-Labor
Field Sampling During Excavation	Material & Equipment	910	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	30384	0-Labor
Field Sampling During Excavation	Health Physics Technicians	28310	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	80322	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	325	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	1550	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1444	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	38050	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	171326	2-Subcontractors
Haul Borrow from Pit	PO Contracts	169883	2-Subcontractors
Spread and Compact Soil	PO Contracts	230204	2-Subcontractors
Finish Grading Site	PO Contracts	3456	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	1288	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1878	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	12661	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$3,103,833**	

Table E-7. 100-B-21:4 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	991	0-Labor
Perform Initial Site Survey	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	28154	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	32495	0-Labor
Provide Field Support and Supervision	First Line Supervisors	49676	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	101108	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	169386	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	145013	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	1013804	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	991	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1444	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	2403	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	12711	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	149	0-Labor
Field Sampling During Excavation	Material & Equipment	650	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	21703	0-Labor
Field Sampling During Excavation	Health Physics Technicians	20222	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	52602	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	260	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	1240	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1156	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	30440	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Backfill Subcontractor Mobilization	PO Contracts	0	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	129285	2-Subcontractors
Haul Borrow from Pit	PO Contracts	115959	2-Subcontractors
Spread and Compact Soil	PO Contracts	167901	2-Subcontractors
Finish Grading Site	PO Contracts	2765	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	991	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1444	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	10276	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$2,168,544**	

Table E-8. 100-B-34 RAD Sewer ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	595	0-Labor
Perform Initial Site Survey	Health Physics Technicians	433	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1,600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16,125	2-Subcontractors
Complete Design and Procurement	PO Contracts	4,670	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	4,642	0-Labor
Provide Field Support and Supervision	First Line Supervisors	10,699	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	14,444	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5,875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	27,316	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	10,793	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	75,572	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	595	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	867	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	543	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	2,167	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	99	0-Labor
Field Sampling During Excavation	Material & Equipment	390	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	3,100	0-Labor
Field Sampling During Excavation	Health Physics Technicians	2,889	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	27,170	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22,830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1,606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10,955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	20,850	2-Subcontractors
Haul Borrow from Pit	PO Contracts	9,665	2-Subcontractors
Spread and Compact Soil	PO Contracts	22,785	2-Subcontractors
Finish Grading Site	PO Contracts	1,215	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	595	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	867	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1,710	2-Subcontractors
Restore Site Area	PO Contracts	4,927	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4,016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6,166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1,461	0-Labor
Move Water Main	Lump Sum	780,000	
	Total $	**1,105,313**	

Table E-9. 116-B-1 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	1387	0-Labor
Perform Initial Site Survey	Health Physics Technicians	1011	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	1095	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	1395	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	1300	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	2880	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	29025	2-Subcontractors
Complete Design and Procurement	PO Contracts	49127	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	57563	0-Labor
Provide Field Support and Supervision	First Line Supervisors	86359	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	179106	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	270464	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	290677	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	2032214	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	1387	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	2022	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	4186	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	22316	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	248	0-Labor
Field Sampling During Excavation	Material & Equipment	845	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	38445	0-Labor
Field Sampling During Excavation	Health Physics Technicians	35821	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	70818	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	358	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	1705	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1589	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	41855	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	206430	2-Subcontractors
Haul Borrow from Pit	PO Contracts	227605	2-Subcontractors
Spread and Compact Soil	PO Contracts	288259	2-Subcontractors
Finish Grading Site	PO Contracts	3674	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	1387	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	2022	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	13413	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$4,000,763**	

Table E-10. 116-B-2 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	595	0-Labor
Perform Initial Site Survey	Health Physics Technicians	433	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	8843	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	9284	0-Labor
Provide Field Support and Supervision	First Line Supervisors	18342	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	28888	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	62003	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	25201	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	176292	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	595	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	867	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	853	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	3900	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	99	0-Labor
Field Sampling During Excavation	Material & Equipment	390	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	6201	0-Labor
Field Sampling During Excavation	Health Physics Technicians	5778	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	27170	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	47324	2-Subcontractors
Haul Borrow from Pit	PO Contracts	22442	2-Subcontractors
Spread and Compact Soil	PO Contracts	51955	2-Subcontractors
Finish Grading Site	PO Contracts	1718	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	595	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	867	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	6663	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$584,722**	

Table E-11. 116-B-3 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	595	0-Labor
Perform Initial Site Survey	Health Physics Technicians	433	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	3281	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	2785	0-Labor
Provide Field Support and Supervision	First Line Supervisors	8407	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	8666	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	15774	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	6000	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	29756	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	595	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	867	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	388	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	1444	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	99	0-Labor
Field Sampling During Excavation	Material & Equipment	390	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	1860	0-Labor
Field Sampling During Excavation	Health Physics Technicians	1733	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	28314	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	12046	2-Subcontractors
Haul Borrow from Pit	PO Contracts	4165	2-Subcontractors
Spread and Compact Soil	PO Contracts	12490	2-Subcontractors
Finish Grading Site	PO Contracts	975	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	595	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	867	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	4099	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$224,051**	

Table E-12. 116-B-4 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	694	0-Labor
Perform Initial Site Survey	Health Physics Technicians	506	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	11844	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	12998	0-Labor
Provide Field Support and Supervision	First Line Supervisors	23691	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	40443	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	88008	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	34509	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	241281	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	694	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1011	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	1085	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	5272	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	149	0-Labor
Field Sampling During Excavation	Material & Equipment	423	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	8681	0-Labor
Field Sampling During Excavation	Health Physics Technicians	8089	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	30206	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	67174	2-Subcontractors
Haul Borrow from Pit	PO Contracts	30944	2-Subcontractors
Spread and Compact Soil	PO Contracts	73315	2-Subcontractors
Finish Grading Site	PO Contracts	1968	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	694	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1011	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	7528	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$769,643**	

Table E-13. 116-B-6A, 116-B-16 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	694	0-Labor
Perform Initial Site Survey	Health Physics Technicians	506	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1,600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16,125	2-Subcontractors
Complete Design and Procurement	PO Contracts	11,287	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	12,070	0-Labor
Provide Field Support and Supervision	First Line Supervisors	22,163	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	37,554	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5,875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	75,643	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	40,311	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	281,868	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	694	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1,011	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	1,008	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	4,983	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	149	0-Labor
Field Sampling During Excavation	Material & Equipment	390	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	8,061	0-Labor
Field Sampling During Excavation	Health Physics Technicians	7,511	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	27,170	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22,830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1,606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10,955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	57,736	2-Subcontractors
Haul Borrow from Pit	PO Contracts	34,239	2-Subcontractors
Spread and Compact Soil	PO Contracts	66,645	2-Subcontractors
Finish Grading Site	PO Contracts	1,916	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	694	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1,011	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1,710	2-Subcontractors
Restore Site Area	PO Contracts	7,346	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4,016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6,166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1,461	0-Labor
	Total $	**780,084**	

Table E-14. 116-B-11 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	2577	0-Labor
Perform Initial Site Survey	Health Physics Technicians	1878	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	3041	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	3876	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	3611	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	8000	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	80625	2-Subcontractors
Complete Design and Procurement	PO Contracts	100000	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	169905	0-Labor
Provide Field Support and Supervision	First Line Supervisors	260606	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	528650	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	1011792	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	704885	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	4927835	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	2577	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	3755	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	12324	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	65287	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	396	0-Labor
Field Sampling During Excavation	Material & Equipment	3510	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	113475	0-Labor
Field Sampling During Excavation	Health Physics Technicians	105730	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	318626	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	1138	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	5426	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	5055	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	133175	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	772239	2-Subcontractors
Haul Borrow from Pit	PO Contracts	576865	2-Subcontractors
Spread and Compact Soil	PO Contracts	947898	2-Subcontractors
Finish Grading Site	PO Contracts	6931	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	2577	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	3755	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	24652	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$10,945,444**	

Table E-15. 116-B-14 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	595	0-Labor
Perform Initial Site Survey	Health Physics Technicians	433	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	6311	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	6499	0-Labor
Provide Field Support and Supervision	First Line Supervisors	14521	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	20222	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	43244	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	14174	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	99102	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	595	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	867	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	620	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	2817	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	99	0-Labor
Field Sampling During Excavation	Material & Equipment	423	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	4341	0-Labor
Field Sampling During Excavation	Health Physics Technicians	4044	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	30206	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	33010	2-Subcontractors
Haul Borrow from Pit	PO Contracts	13206	2-Subcontractors
Spread and Compact Soil	PO Contracts	35077	2-Subcontractors
Finish Grading Site	PO Contracts	1387	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	595	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	867	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	5523	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$416,202**	

Table E-16. 116-C-1 ROM Cost Details

Task Title	RES	Resource Title	Cost	Resource Type
Perform Initial Site Survey	T030-1N-REG	Engineering Technicians	2,874	0-Labor
Perform Initial Site Survey	T050-1N-REG	Health Physics Technicians	2,094	0-Labor
Perform Pre-excavation Sampling and Analysis	10	Material & Equipment	3,041	1-Materials
Perform Pre-excavation Sampling and Analysis	R051-1N-REG	Nuclear Wst Process Oper (NCO)	3,876	0-Labor
Perform Pre-excavation Sampling and Analysis	T050-1N-REG	Health Physics Technicians	3,611	0-Labor
Perform Pre-excavation Sampling and Analysis	XA	OHC-XFER Motor Carrier Srvcs	8,000	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	XW	OHC-XFER WSCF Lab -Smpl Analy	80,625	2-Subcontractors
Complete Design and Procurement	21	PO Contracts	100,000	2-Subcontractors
Provide Field Support and Supervision	E100-1N-REG	Plant Engineers	402,943	0-Labor
Provide Field Support and Supervision	M010-1N-REG	First Line Supervisors	538,025	0-Labor
Provide Field Support and Supervision	T050-1N-REG	Health Physics Technicians	1,253,739	0-Labor
Excavation Subcontractor Mobilization	21	PO Contracts	5,875	2-Subcontractors
Excavate Non-contaminated Soil	21	PO Contracts	1,557,061	2-Subcontractors
Excavate Contaminated Soil	21	PO Contracts	2,377,290	2-Subcontractors
Waste Disposal	WG	Solid MLLW/LLW DDW-ERDF (ton)	16,619,630	3-Other Direct Cost
Perform Post Excavation Survey	T030-1N-REG	Engineering Technicians	2,874	0-Labor
Perform Post Excavation Survey	T050-1N-REG	Health Physics Technicians	4,189	0-Labor
NPO & HPT Training Attendance	R051-1N-REG	Nuclear Wst Process Oper (NCO)	27,981	0-Labor
NPO & HPT Training Attendance	T050-1N-REG	Health Physics Technicians	152,456	0-Labor
Other Field Techs Training Attendance	T030-1N-REG	Engineering Technicians	446	0-Labor
Field Sampling During Excavation	10	Material & Equipment	5,785	1-Materials
Field Sampling During Excavation	R051-1N-REG	Nuclear Wst Process Oper (NCO)	269,115	0-Labor
Field Sampling During Excavation	T050-1N-REG	Health Physics Technicians	250,748	0-Labor
Field Sampling During Excavation	XW	OHC-XFER WSCF Lab -Smpl Analy	543,730	2-Subcontractors
Perform Verification Field Sampling	10	Material & Equipment	1,333	1-Materials
Perform Verification Field Sampling	R051-1N-REG	Nuclear Wst Process Oper (NCO)	6,356	0-Labor
Perform Verification Field Sampling	T050-1N-REG	Health Physics Technicians	5,922	0-Labor
Perform Verification Field Sampling	XW	OHC-XFER WSCF Lab -Smpl Analy	156,005	2-Subcontractors
Prepare As-Built Drawings	E050-1N-REG	Environmental Engineers	1,606	0-Labor
Prepare As-Built Drawings	E020-1N-REG	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	21	PO Contracts	10,955	2-Subcontractors
Transport Stockpiled Soil	21	PO Contracts	1,188,407	2-Subcontractors
Haul Borrow from Pit	21	PO Contracts	1,815,487	2-Subcontractors
Spread and Compact Soil	21	PO Contracts	1,899,503	2-Subcontractors
Finish Grading Site	21	PO Contracts	7,625	2-Subcontractors
Perform Post Backfill Survey	T030-1N-REG	Engineering Technicians	2,874	0-Labor
Perform Post Backfill Survey	T050-1N-REG	Health Physics Technicians	4,189	0-Labor
Backfill Subcontractor Demobilization	21	PO Contracts	1,710	2-Subcontractors
Restore Site Area	21	PO Contracts	27,044	2-Subcontractors
Prepare/Submit RAR Documentation	E050-1N-REG	Environmental Engineers	4,016	0-Labor
Prepare/Submit RAR Documentation	E020-1N-REG	Civil Engineers	6,166	0-Labor
Prepare/Submit RAR Documentation	P160-1N-REG	Technical Writers & Editors	1,461	0-Labor
		Total $	**29,357,649**	

Table E-17. 116-C-2A, 116-C-2B, 116-C-2C ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	991	0-Labor
Perform Initial Site Survey	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	29621	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	33424	0-Labor
Provide Field Support and Supervision	First Line Supervisors	51204	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	103997	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	179498	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	152156	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	1063728	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	991	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1444	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	2480	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	13072	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	149	0-Labor
Field Sampling During Excavation	Material & Equipment	650	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	22323	0-Labor
Field Sampling During Excavation	Health Physics Technicians	20799	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	51458	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	260	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	1240	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1156	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	30440	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	137002	2-Subcontractors
Haul Borrow from Pit	PO Contracts	121802	2-Subcontractors
Spread and Compact Soil	PO Contracts	177411	2-Subcontractors
Finish Grading Site	PO Contracts	2784	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	991	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1444	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	10342	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$2,266,185**	

Table E-18. 116-C-3 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	595	0-Labor
Perform Initial Site Survey	Health Physics Technicians	433	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	6011	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	6499	0-Labor
Provide Field Support and Supervision	First Line Supervisors	13756	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	20222	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	43452	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	10433	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	72957	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	595	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	867	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	620	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	2817	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	99	0-Labor
Field Sampling During Excavation	Material & Equipment	455	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	4341	0-Labor
Field Sampling During Excavation	Health Physics Technicians	4044	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	33242	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	195	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	930	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	867	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	22830	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	33170	2-Subcontractors
Haul Borrow from Pit	PO Contracts	10535	2-Subcontractors
Spread and Compact Soil	PO Contracts	33948	2-Subcontractors
Finish Grading Site	PO Contracts	1294	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	595	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	867	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	5200	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$384,472**	

Table E-19. 116-C-5 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	4162	0-Labor
Perform Initial Site Survey	Health Physics Technicians	3033	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	3527	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	4496	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	4189	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	9280	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	93525	2-Subcontractors
Complete Design and Procurement	PO Contracts	100000	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	252536	0-Labor
Provide Field Support and Supervision	First Line Supervisors	378299	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	785754	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	1570366	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	985164	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	6887340	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	4162	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	6066	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	18215	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	97064	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	644	0-Labor
Field Sampling During Excavation	Material & Equipment	5980	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	168662	0-Labor
Field Sampling During Excavation	Health Physics Technicians	157151	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	549362	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	1788	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	8526	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	7944	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	209275	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	1198559	2-Subcontractors
Haul Borrow from Pit	PO Contracts	817198	2-Subcontractors
Spread and Compact Soil	PO Contracts	1434071	2-Subcontractors
Finish Grading Site	PO Contracts	11213	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	4162	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	6066	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	39427	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$15,859,980**	

Table E-20. 118-B-1 ROM Cost Details

Task Title	RES	Resource Title	Cost	Resource Type
Perform Initial Site Survey	T030-1N-REG	Engineering Technicians	2,676	0-Labor
Perform Initial Site Survey	T050-1N-REG	Health Physics Technicians	1,950	0-Labor
Perform Pre-excavation Sampling and Analysis	10	Material & Equipment	2,554	1-Materials
Perform Pre-excavation Sampling and Analysis	R051-1N-REG	Nuclear Wst Process Oper (NCO)	3,255	0-Labor
Perform Pre-excavation Sampling and Analysis	T050-1N-REG	Health Physics Technicians	3,033	0-Labor
Perform Pre-excavation Sampling and Analysis	XA	OHC-XFER Motor Carrier Srvcs	6,720	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	XW	OHC-XFER WSCF Lab -Smpl Analy	67,725	2-Subcontractors
Complete Design and Procurement	21	PO Contracts	100,000	2-Subcontractors
Provide Field Support and Supervision	E100-1N-REG	Plant Engineers	533,853	0-Labor
Provide Field Support and Supervision	M010-1N-REG	First Line Supervisors	695,458	0-Labor
Provide Field Support and Supervision	T050-1N-REG	Health Physics Technicians	1,661,060	0-Labor
Excavation Subcontractor Mobilization	21	PO Contracts	5,875	2-Subcontractors
Excavate Non-contaminated Soil	21	PO Contracts	2,267,265	2-Subcontractors
Excavate Contaminated Soil	21	PO Contracts	2,988,493	2-Subcontractors
Waste Disposal	WG	Solid MLLW/LLW DDW-ERDF (ton)	20,892,470	3-Other Direct Cost
Perform Post Excavation Survey	T030-1N-REG	Engineering Technicians	2,676	0-Labor
Perform Post Excavation Survey	T050-1N-REG	Health Physics Technicians	3,900	0-Labor
NPO & HPT Training Attendance	R051-1N-REG	Nuclear Wst Process Oper (NCO)	36,662	0-Labor
NPO & HPT Training Attendance	T050-1N-REG	Health Physics Technicians	201,277	0-Labor
Other Field Techs Training Attendance	T030-1N-REG	Engineering Technicians	446	0-Labor
Field Sampling During Excavation	10	Material & Equipment	4,843	1-Materials
Field Sampling During Excavation	R051-1N-REG	Nuclear Wst Process Oper (NCO)	356,546	0-Labor
Field Sampling During Excavation	T050-1N-REG	Health Physics Technicians	332,212	0-Labor
Field Sampling During Excavation	XW	OHC-XFER WSCF Lab -Smpl Analy	444,246	2-Subcontractors
Perform Verification Field Sampling	10	Material & Equipment	1,365	1-Materials
Perform Verification Field Sampling	R051-1N-REG	Nuclear Wst Process Oper (NCO)	6,511	0-Labor
Perform Verification Field Sampling	T050-1N-REG	Health Physics Technicians	6,066	0-Labor
Perform Verification Field Sampling	XW	OHC-XFER WSCF Lab -Smpl Analy	159,810	2-Subcontractors
Prepare As-Built Drawings	E050-1N-REG	Environmental Engineers	1,606	0-Labor
Prepare As-Built Drawings	E020-1N-REG	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	21	PO Contracts	10,955	2-Subcontractors
Transport Stockpiled Soil	21	PO Contracts	1,730,458	2-Subcontractors
Haul Borrow from Pit	21	PO Contracts	2,303,968	2-Subcontractors
Spread and Compact Soil	21	PO Contracts	2,604,555	2-Subcontractors
Finish Grading Site	21	PO Contracts	7,153	2-Subcontractors
Perform Post Backfill Survey	T030-1N-REG	Engineering Technicians	2,676	0-Labor
Perform Post Backfill Survey	T050-1N-REG	Health Physics Technicians	3,900	0-Labor
Backfill Subcontractor Demobilization	21	PO Contracts	1,710	2-Subcontractors
Restore Site Area	21	PO Contracts	25,418	2-Subcontractors
Prepare/Submit RAR Documentation	E050-1N-REG	Environmental Engineers	4,016	0-Labor
Prepare/Submit RAR Documentation	E020-1N-REG	Civil Engineers	6,166	0-Labor
Prepare/Submit RAR Documentation	P160-1N-REG	Technical Writers & Editors	1,461	0-Labor
		Total $	**37,493,974**	

Table E-21. 118-B-6 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	991	0-Labor
Perform Initial Site Survey	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	1600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	16125	2-Subcontractors
Complete Design and Procurement	PO Contracts	31917	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	35281	0-Labor
Provide Field Support and Supervision	First Line Supervisors	55790	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	109774	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	281046	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	77623	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	542696	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	991	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1444	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	2635	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	13794	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	149	0-Labor
Field Sampling During Excavation	Material & Equipment	618	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	23563	0-Labor
Field Sampling During Excavation	Health Physics Technicians	21955	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	49566	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	293	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	1395	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1300	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	34245	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	214507	2-Subcontractors
Haul Borrow from Pit	PO Contracts	75423	2-Subcontractors
Spread and Compact Soil	PO Contracts	223005	2-Subcontractors
Finish Grading Site	PO Contracts	2613	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	991	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1444	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	9753	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$1,868,131**	

Table E-22. 118-B-8:4 ROM Cost Details

Task Title	RES	Resource Title	Cost	Resource Type
Perform Initial Site Survey	T030-1N-REG	Engineering Technicians	2,577	0-Labor
Perform Initial Site Survey	T050-1N-REG	Health Physics Technicians	1,878	0-Labor
Perform Pre-excavation Sampling and Analysis	10	Material & Equipment	608	1-Materials
Perform Pre-excavation Sampling and Analysis	R051-1N-REG	Nuclear Wst Process Oper (NCO)	775	0-Labor
Perform Pre-excavation Sampling and Analysis	T050-1N-REG	Health Physics Technicians	722	0-Labor
Perform Pre-excavation Sampling and Analysis	XA	OHC-XFER Motor Carrier Srvcs	1,600	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	XW	OHC-XFER WSCF Lab -Smpl Analy	16,125	2-Subcontractors
Complete Design and Procurement	21	PO Contracts	100,000	2-Subcontractors
Provide Field Support and Supervision	E100-1N-REG	Plant Engineers	273,890	0-Labor
Provide Field Support and Supervision	M010-1N-REG	First Line Supervisors	373,713	0-Labor
Provide Field Support and Supervision	T050-1N-REG	Health Physics Technicians	852,196	0-Labor
Excavation Subcontractor Mobilization	21	PO Contracts	5,875	2-Subcontractors
Excavate Non-contaminated Soil	21	PO Contracts	1,599,192	2-Subcontractors
Excavate Contaminated Soil	21	PO Contracts	1,165,484	2-Subcontractors
Waste Disposal	WG	Solid MLLW/LLW DDW-ERDF (ton)	8,147,903	3-Other Direct Cost
Perform Post Excavation Survey	T030-1N-REG	Engineering Technicians	2,577	0-Labor
Perform Post Excavation Survey	T050-1N-REG	Health Physics Technicians	3,755	0-Labor
NPO & HPT Training Attendance	R051-1N-REG	Nuclear Wst Process Oper (NCO)	18,835	0-Labor
NPO & HPT Training Attendance	T050-1N-REG	Health Physics Technicians	103,708	0-Labor
Other Field Techs Training Attendance	T030-1N-REG	Engineering Technicians	396	0-Labor
Field Sampling During Excavation	10	Material & Equipment	1,398	1-Materials
Field Sampling During Excavation	R051-1N-REG	Nuclear Wst Process Oper (NCO)	182,924	0-Labor
Field Sampling During Excavation	T050-1N-REG	Health Physics Technicians	170,439	0-Labor
Field Sampling During Excavation	XW	OHC-XFER WSCF Lab -Smpl Analy	122,430	2-Subcontractors
Perform Verification Field Sampling	10	Material & Equipment	943	1-Materials
Perform Verification Field Sampling	R051-1N-REG	Nuclear Wst Process Oper (NCO)	4,496	0-Labor
Perform Verification Field Sampling	T050-1N-REG	Health Physics Technicians	4,189	0-Labor
Perform Verification Field Sampling	XW	OHC-XFER WSCF Lab -Smpl Analy	110,345	2-Subcontractors
Prepare As-Built Drawings	E050-1N-REG	Environmental Engineers	1,606	0-Labor
Prepare As-Built Drawings	E020-1N-REG	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	21	PO Contracts	10,955	2-Subcontractors
Transport Stockpiled Soil	21	PO Contracts	1,220,563	2-Subcontractors
Haul Borrow from Pit	21	PO Contracts	948,640	2-Subcontractors
Spread and Compact Soil	21	PO Contracts	1,515,720	2-Subcontractors
Finish Grading Site	21	PO Contracts	7,043	2-Subcontractors
Perform Post Backfill Survey	T030-1N-REG	Engineering Technicians	2,577	0-Labor
Perform Post Backfill Survey	T050-1N-REG	Health Physics Technicians	3,755	0-Labor
Backfill Subcontractor Demobilization	21	PO Contracts	1,710	2-Subcontractors
Restore Site Area	21	PO Contracts	25,036	2-Subcontractors
Prepare/Submit RAR Documentation	E050-1N-REG	Environmental Engineers	4,016	0-Labor
Prepare/Submit RAR Documentation	E020-1N-REG	Civil Engineers	6,166	0-Labor
Prepare/Submit RAR Documentation	P160-1N-REG	Technical Writers & Editors	1,461	0-Labor
		Total $	**17,019,205**	

Table E-23. 118-C-1 ROM Cost Details

Task Title	Resource Title	Cost	Resource Type
Perform Initial Site Survey	Engineering Technicians	1288	0-Labor
Perform Initial Site Survey	Health Physics Technicians	939	0-Labor
Perform Pre-excavation Sampling and Analysis	Material & Equipment	1581	1-Materials
Perform Pre-excavation Sampling and Analysis	Nuclear Wst Process Oper (NCO)	2015	0-Labor
Perform Pre-excavation Sampling and Analysis	Health Physics Technicians	1878	0-Labor
Perform Pre-excavation Sampling and Analysis	OHC-XFER Motor Carrier Srvcs	4160	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	OHC-XFER WSCF Lab -Smpl Analy	41925	2-Subcontractors
Complete Design and Procurement	PO Contracts	23637	2-Subcontractors
Provide Field Support and Supervision	Plant Engineers	25996	0-Labor
Provide Field Support and Supervision	First Line Supervisors	48147	0-Labor
Provide Field Support and Supervision	Health Physics Technicians	80886	0-Labor
Excavation Subcontractor Mobilization	PO Contracts	5875	2-Subcontractors
Excavate Non-contaminated Soil	PO Contracts	195137	2-Subcontractors
Excavate Contaminated Soil	PO Contracts	66118	2-Subcontractors
Waste Disposal	Solid MLLW/LLW DDW-ERDF (ton)	462269	3-Other Direct Cost
Perform Post Excavation Survey	Engineering Technicians	1288	0-Labor
Perform Post Excavation Survey	Health Physics Technicians	1878	0-Labor
NPO & HPT Training Attendance	Nuclear Wst Process Oper (NCO)	2093	0-Labor
NPO & HPT Training Attendance	Health Physics Technicians	10544	0-Labor
Other Field Techs Training Attendance	Engineering Technicians	198	0-Labor
Field Sampling During Excavation	Material & Equipment	910	1-Materials
Field Sampling During Excavation	Nuclear Wst Process Oper (NCO)	17362	0-Labor
Field Sampling During Excavation	Health Physics Technicians	16177	0-Labor
Field Sampling During Excavation	OHC-XFER WSCF Lab -Smpl Analy	75746	2-Subcontractors
Perform Verification Field Sampling	Material & Equipment	293	1-Materials
Perform Verification Field Sampling	Nuclear Wst Process Oper (NCO)	1395	0-Labor
Perform Verification Field Sampling	Health Physics Technicians	1300	0-Labor
Perform Verification Field Sampling	OHC-XFER WSCF Lab -Smpl Analy	34245	2-Subcontractors
Prepare As-Built Drawings	Environmental Engineers	1606	0-Labor
Prepare As-Built Drawings	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	PO Contracts	10955	2-Subcontractors
Transport Stockpiled Soil	PO Contracts	148941	2-Subcontractors
Haul Borrow from Pit	PO Contracts	61140	2-Subcontractors
Spread and Compact Soil	PO Contracts	159008	2-Subcontractors
Finish Grading Site	PO Contracts	3371	2-Subcontractors
Perform Post Backfill Survey	Engineering Technicians	1288	0-Labor
Perform Post Backfill Survey	Health Physics Technicians	1878	0-Labor
Backfill Subcontractor Demobilization	PO Contracts	1710	2-Subcontractors
Restore Site Area	PO Contracts	12367	2-Subcontractors
Prepare/Submit RAR Documentation	Environmental Engineers	4016	0-Labor
Prepare/Submit RAR Documentation	Civil Engineers	6166	0-Labor
Prepare/Submit RAR Documentation	Technical Writers & Editors	1461	0-Labor
	Total	**$1,540,174**	

Table E-24. 118-C-3:2 ROM Cost Details

Task Title	RES	Resource Title	Cost	Resource Type
Perform Initial Site Survey	T030-1N-REG	Engineering Technicians	1,487	0-Labor
Perform Initial Site Survey	T050-1N-REG	Health Physics Technicians	1,083	0-Labor
Perform Pre-excavation Sampling and Analysis	10	Material & Equipment	1,581	1-Materials
Perform Pre-excavation Sampling and Analysis	R051-1N-REG	Nuclear Wst Process Oper (NCO)	2,015	0-Labor
Perform Pre-excavation Sampling and Analysis	T050-1N-REG	Health Physics Technicians	1,878	0-Labor
Perform Pre-excavation Sampling and Analysis	XA	OHC-XFER Motor Carrier Srvcs	4,160	2-Subcontractors
Perform Pre-excavation Sampling and Analysis	XW	OHC-XFER WSCF Lab -Smpl Analy	41,925	2-Subcontractors
Complete Design and Procurement	21	PO Contracts	48,499	2-Subcontractors
Provide Field Support and Supervision	E100-1N-REG	Plant Engineers	56,635	0-Labor
Provide Field Support and Supervision	M010-1N-REG	First Line Supervisors	85,595	0-Labor
Provide Field Support and Supervision	T050-1N-REG	Health Physics Technicians	176,217	0-Labor
Excavation Subcontractor Mobilization	21	PO Contracts	5,875	2-Subcontractors
Excavate Non-contaminated Soil	21	PO Contracts	270,744	2-Subcontractors
Excavate Contaminated Soil	21	PO Contracts	282,999	2-Subcontractors
Waste Disposal	WG	Solid MLLW/LLW DDW-ERDF (ton)	1,978,554	3-Other Direct Cost
Perform Post Excavation Survey	T030-1N-REG	Engineering Technicians	1,487	0-Labor
Perform Post Excavation Survey	T050-1N-REG	Health Physics Technicians	2,167	0-Labor
NPO & HPT Training Attendance	R051-1N-REG	Nuclear Wst Process Oper (NCO)	4,186	0-Labor
NPO & HPT Training Attendance	T050-1N-REG	Health Physics Technicians	22,099	0-Labor
Other Field Techs Training Attendance	T030-1N-REG	Engineering Technicians	248	0-Labor
Field Sampling During Excavation	10	Material & Equipment	1,073	1-Materials
Field Sampling During Excavation	R051-1N-REG	Nuclear Wst Process Oper (NCO)	37,825	0-Labor
Field Sampling During Excavation	T050-1N-REG	Health Physics Technicians	35,243	0-Labor
Field Sampling During Excavation	XW	OHC-XFER WSCF Lab -Smpl Analy	92,070	2-Subcontractors
Perform Verification Field Sampling	10	Material & Equipment	358	1-Materials
Perform Verification Field Sampling	R051-1N-REG	Nuclear Wst Process Oper (NCO)	1,705	0-Labor
Perform Verification Field Sampling	T050-1N-REG	Health Physics Technicians	1,589	0-Labor
Perform Verification Field Sampling	XW	OHC-XFER WSCF Lab -Smpl Analy	41,855	2-Subcontractors
Prepare As-Built Drawings	E050-1N-REG	Environmental Engineers	1,606	0-Labor
Prepare As-Built Drawings	E020-1N-REG	Civil Engineers	987	0-Labor
Excavation Subcontractor Demobilization	21	PO Contracts	10,955	2-Subcontractors
Backfill Subcontractor Mobilization	21	PO Contracts	0	2-Subcontractors
Transport Stockpiled Soil	21	PO Contracts	206,643	2-Subcontractors
Haul Borrow from Pit	21	PO Contracts	222,117	2-Subcontractors
Spread and Compact Soil	21	PO Contracts	285,838	2-Subcontractors
Finish Grading Site	21	PO Contracts	3,876	2-Subcontractors
Perform Post Backfill Survey	T030-1N-REG	Engineering Technicians	1,487	0-Labor
Perform Post Backfill Survey	T050-1N-REG	Health Physics Technicians	2,167	0-Labor
Backfill Subcontractor Demobilization	21	PO Contracts	1,710	2-Subcontractors
Restore Site Area	21	PO Contracts	14,110	2-Subcontractors
Prepare/Submit RAR Documentation	E050-1N-REG	Environmental Engineers	4,016	0-Labor
Prepare/Submit RAR Documentation	E020-1N-REG	Civil Engineers	6,166	0-Labor
Prepare/Submit RAR Documentation	P160-1N-REG	Technical Writers & Editors	1,461	0-Labor
		Total $	**3,964,286**	

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