

World Resources Company
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Attachment 13
Final Permit

ATTACHMENT 13
CLOSURE COST ESTIMATE




Technical Memorandum

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Prepared for: World Resources Company
Project Title: RCRA Permit Support
Project No.: 143503.001
Subject: Appendix J - Closure Cost Estimate

Date: June 13, 2014
To: Ms. Kimberly Myers
From: Jarrell Southall, Project Advisor



Prepared by: 
Larry B. Williams, Arizona P.E. License No. 51374, Expires 9/30/2016

Limitations:

This document was prepared solely for World Resources Company. In accordance with professional standards at the time the services were performed and in accordance with the contract between World Resources Company and Brown and Caldwell dated October 16, 2012. This document is governed by the specific scope of work authorized by World Resources Company; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by World Resources Company and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Executive Summary

This Closure Cost Estimate describes the estimated cost of closing the World Resources Company (WRC) Hazardous Waste Management Unit (HWMU) in accordance with the Closure Plan and the associated Equipment Decontamination and Removal Plan (EDRP) that are included, respectively, as Section 11 and Attachment 11-A in WRC's 2014 RCRA Hazardous Waste Application. This Closure Cost Estimate was prepared using industry standard costing methods and should not be construed as anything but an approximate estimate of the closure costs based on information available at the time the estimate was prepared.

The Closure Cost Estimate shown in Table 1 below is primarily based on methods and cost factors described in *Final Report/Guidance Manual: Cost Estimate for Closure and Post-closure Plans (Subparts G & H Volumes I-IV)* as incorporated into the CostPro®, Version 6.1, software that is available from the United States Environmental Protection Agency for estimating closure and post-closure costs. The CostPro® program includes stored cost data and approximately 100 worksheets for calculating the cost of specific closure and post-closure activities for the principal types of hazardous waste management facilities. However, the program enables site-specific data to be substituted for stored cost data where site-specific data are more appropriate. It also includes a template for user-defined worksheets for activities that are not adequately addressed by the standard worksheets.

During the process of using CostPro®, it was determined that CostPro® was referencing outdated R.S. Means unit cost and production efficiency data. The outdated unit cost and production efficiencies have been updated to reflect current work rates and cost data (R.S. Means, Building Construction Cost Data, 2014).

CostPro®'s activity worksheets and cost data were used in the development of the above Closure Cost Estimate to the extent practicable. Where they are not practicable, selected alternatives are thoroughly documented in worksheet footnotes. The worksheets are grouped under summary worksheets showing the total cost for a specific activity such as transportation. It is important to note that worksheet names, titles, subheadings, and number systems from CostPro® cannot be edited. As such, the nomenclature used in CostPro®'s worksheets is generalized and may not reflect terminology specific to the site. Attachment J-1 includes a cross-reference table linking the closure-related activities with activity-specific worksheets that are included in Attachment J-2.

Activities required to complete the Closure Plan and the EDRP are grouped under the activities shown in Table 1. The closure Cost Estimate for each activity is shown for the two major phases of the Closure Plan, as defined below. Phase 1 includes the removal of recyclable materials and Phase 2 includes all other closure-related activities. The Closure Plan provides that traditional closure activities (e.g., the decontamination and removal of equipment) may not begin until all the recyclable materials and the products of the recycling process (generally referred to as "concentrates") have been removed from the HWMU. Consistent with Arizona Administrative Code (A.A.C.) R18-8-264.142(a)(1), the Closure Cost Estimate must be based on the assumption that the maximum permitted inventory (3,800 tons or 4,685 cubic yards) will be on site when notice of closure is given and that the entire amount must be removed and transported to a hazardous waste management facility for disposal as hazardous waste.

There is a higher degree of certainty in the Phase 1 portion of the Closure Cost Estimate than in the Phase 2 portion of the estimate. All unit costs reflect current costs and it is unlikely that the inventory of recyclable materials, including concentrates, will ever approach the maximum permitted inventory. Also, for reasons described below, the Phase 1 cost estimate does not include the potential recovery of economic values of the recyclable materials and concentrates. Because there is a high degree of certainty that the estimated costs for Phase I will not be exceeded, the Phase 1 cost estimate includes a 10% contingency allowance.

Consistent with R18-8-264.142(a)(3), the Phase 1 and Phase 2 cost estimates do not incorporate any salvage value that may be realized from the sale of hazardous waste, facility structures, equipment, land or other assets. For that reason, the cost estimate for Phase 1 does not reflect credit for any recovery of the recyclable material and concentrates addressed in Phase 1. Similarly, the cost estimate for Phase 2 does not include credit for the salvage of equipment even though the Closure Plan reflects a salvage option for sufficiently decontaminated equipment. Rather, the cost estimate for Phase 2 includes the costs of dismantling, decontaminating, inspecting, transporting, and disposing in a non-hazardous landfill all process equipment located within the HWMU.

The Phase 2 Closure Cost Estimate also includes costs for the hypothetical removal of a portion of the HWMU's concrete floor and underlying soil even though WRC has proposed, as part of the permit, a Concrete Management Program that is specifically designed to minimize the need for concrete and soil removal at closure. Even though the factors described above indicate that the hypothetical concrete and soil removal costs are unlikely to be required, there is generally less certainty in excavation work. For that reason, the Phase 2 Closure Cost Estimate includes a 20% contingency allowance.

Table 1. Closure Cost Estimate

Activity	Closure Cost Estimate—Phase 1	Closure Cost Estimate—Phase 2	Totals
Removal of Waste	\$29,600	-	\$29,600
Demolition and Removal of Concrete Structures	-	\$49,000	\$49,000
Removal of Soil	-	\$3,300	\$3,300
Backfill and Grading	-	\$39,900	\$39,900
Decontamination	-	\$517,900	\$517,900
Sampling and Analysis	-	\$141,500	\$141,500
Transportation	\$530,150	\$57,100	\$587,300
Treatment and Disposal	\$937,000	\$268,500	\$1,205,500
User Defined Cost	-	\$113,000	\$113,000
Engineering Expenses (10%)	\$149,700	\$119,000	\$268,700
Certificate of Closure	-	\$83,600	\$83,600
Contingency Allowance	\$164,600	\$278,500	\$443,000
TOTAL CLOSURE COST ESTIMATE	\$1,811,050	\$1,671,300	\$3,482,350

CostPro®'s activity worksheets and cost data were used in the development of the above Closure Cost Estimate to the extent practicable. Where they are not practicable, selected alternatives are thoroughly documented in worksheet footnotes. The worksheets are grouped under summary worksheets showing the total cost for a specific activity such as transportation. It is important to note that worksheet names, titles, subheadings, and number systems from CostPro® cannot be edited. As such, the nomenclature used in CostPro®'s worksheets is generalized and may not reflect terminology specific to the site. Attachment J-1 includes a cross-reference table linking the closure-related activities with activity-specific worksheets that are included in Attachment J-2.

The total Closure Cost Estimate shown in the above table includes mandatory cost estimates for activities that may never occur. Pursuant to A.A.C. R18-8-264.142(a)(3), the Closure Cost Estimate required by R18-8-264.142(a) shall not reflect estimated salvage values for wastes, equipment, structures, etc. Therefore, cost estimates for the removal of recyclable materials and the products of the recycling process (generally referred to as "concentrates") have been calculated assuming that such materials and concentrates, equal

to the maximum permitted operating capacity of 3,800 tons (4,685 cubic yards), will be shipped to a hazardous waste disposal facility, even though WRC has previously indicated plans to ship most, if not all, of the materials and concentrates to facilities where the economic value of the material and products can be recovered. Similarly, the cost estimates for decontaminating and removing equipment from the HWMU have been calculated assuming that the equipment will be sent to disposal facilities, even though WRC plans to salvage as much of the equipment as is economically practicable.

Attachment J-1: Cross-Reference Table

**Attachment J-1
Cross-Reference Table**

PHASE 1 CLOSURE COST ESTIMATE			
Activities	Level of Worker Protection	Cost Estimate	Location in CostPro Worksheet
Section 1. Recyclable Material Removal/Disposal as a Hazardous Waste			
Loading of Recyclable Materials	C	\$29,600	Page 4, "Waste Piles Removal of Waste" (WP_03-1)(4,685 cu. yds)
Transportation of Recyclable Materials	-	\$530,150	Page 7, "Transportation of Waste" (TR_01-1)(4,685 cu. yds)
Disposal of Recyclable Materials	-	\$937,000	Page 6, "Treatment and Disposal of Waste" (TD_02-1)(4,685 cu. yds)
Subtotal of Closure Costs		<u>\$1,496,750</u>	
Engineering Services-Including but not limited to- Data analysis and evaluation, closure documentation, closure certification, survey plat, oversight of closure activities, sample and data management.	-	\$149,700	Page 2, "Waste Piles Summary" (WP_02-1) 10% Engineering Expenses
Contingency fund (10%)	-	\$164,600	Page 2, "Waste Piles Summary" (WP_02-1) 10% Contingency
Subtotal of Phase 1 Closure Cost Estimate		<u>\$1,811,050</u>	
PHASE 2 CLOSURE COST ESTIMATE			
Section 2. Equipment Decontamination and Removal (EDRP) Activities			
Activities	Level of Worker Protection	Cost Estimate	Location in CostPro Worksheet
De-energizing and disconnecting all power lines to the TCU, WEIMA shredder, Prodeva Shredder, Blender, and Control Room. Disconnecting and capping of all lines (e.g., natural gas, water, and agglomerating fluids) to the TCU, shredder, and blender. Lowering the TCU, shredder, blender, and ancillary equipment to the HWMU floor using a Crane. Disassembling of the TCU, shredders, blender, agglomerating tanks, and related components including TCU control room.	C	\$49,200	Page 53, "User Defined Activity" (UD_01-1) Dismantle TCU/Shredder/Blender
Decontamination of disassembled components	C	\$25,200	Page 15, "Decontamination by Steam Cleaning or Pressure Wash" (DC_02-2)
Testing of salvaged equipment by wipe sampling.	-	N/A	Not Included in cost estimate because salvage credits are not allowed by regulations.
Disassembly of the HWMU's fabric canopy and supporting structure.	D	\$46,400	Page 56, "User Defined Activity" (UD_01-2) Dismantle Canopy
Decontamination of the fabric canopy and supporting structure.	D	\$47,200	Page 13, "Decontamination by Steam Cleaning or Pressure Wash" (DC_02-4)
Floor sweeping the HWMU	C	\$4,700	Page 52 "User Defined Activity" (UD_01-3) HWMU floor sweep
Decontamination of inner and outer surfaces of the mobile equipment used for removal of recyclable material, equipment, etc.	C	\$6,500	Page 17, "Decontamination of Heavy Equipment" (DC_04-1)
Use of portable equipment (e.g. squeegees, vacuum sweepers, booms) to convey stormwater and decon liquids to appropriate treatment units.	-	N/A	Included in the costs of each decontamination activity.
Concrete patching/repair of damage to concrete pads and connecting joints as necessary to prevent liquid migration from the HWMU.	D	\$12,700	Page 55, "User Defined Activity" (UD_01-4) Concrete Patching/Repair
Decontamination of HWMU floor and inwardly facing portions of the HWMU berms.	D	\$300,200	Page 14, "Decontamination by Steam Cleaning or Pressure Wash" (DC_02-1)
Decontamination of WRC's wastewater treatment facility, (2) 30-yd rolloff boxes, and (4) 21K Frac Tanks.	C	\$138,700	Page 16, "Decontamination by Steam Cleaning or Pressure Wash" (DC_02-3)
Transportation of hazardous waste residues, filter media, and decontamination fluids/solids not being treated on site, and equipment components that do not meet R18-8-268.45	-	\$27,100	Page 49, "Transportation of Waste" (TR_01-2)

**Attachment J-1
Cross-Reference Table**

Activities	Level of Worker Protection	Cost Estimate	Location in CostPro Worksheet
Disposal as hazardous waste of all residues, filter media, decontamination water not treated on-site, and any equipment component that cannot meet debris treatment requirements for R18-8-268.45.	-	\$35,150	Page 45, "Treatment and Disposal of Waste" (TD_02-2)
Salvage of equipment	-	N/A	Salvage is included in EDRP; however, regulations require cost estimate to assume no salvage credit.
Transportation of TCU/Blender/Shredders/Agglomerating Tanks to non-hazardous waste disposal facility	-	\$1,500	Page 50, "Transportation of Waste" (TR_01-3) TCU/Shredders/Blender/Agglomerating Tanks
Disposal of TCU/Shredders(2)/Blender/Agglomerating Tanks in non-hazardous landfills of decontaminated items that meet R18-8-268.45.	-	\$10,100	Page 39 (Subtotal), "Treatment and Disposal of Waste" (TD_02-3) TCU/Shredder/Blender (Excludes Decon Water Treatment)
Transportation of Canopy materials to a non-hazardous waste disposal facility	-	\$2,000	Page 52, "Transportation of Waste" (TR_01-4) Canopy
Disposal of Canopy in non-hazardous landfills of decontaminated items that meet R18-8-268.45.	-	\$19,700	Page 43 (Subtotal), "Treatment and Disposal" (TD_02-4) Canopy
Treatment of Stormwater and Decontamination fluids generated during closure activities in on-site WWTP	-	\$9,100	Page 41, "Treatment of Disposal of Waste (TD_02-1) Pad Decon Water
Treatment of TCU/Shredder/Blender Decontamination fluids generated during closure activities in on-site WWTP	-	\$500	Page 39, "Treatment and Disposal of Waste" (TD_02-3) TCU/Shredder/Blender Decon
Treatment of Canopy Decontamination fluids generated during closure activities in on-site WWTP	-	\$7,500	Page 43 (Subtotal), "Treatment and Disposal of Waste (TD_02-4) Canopy Decon
Treatment of Stormwater generated during closure activities in on-site WWTP (assume 6 months rainfall)	-	\$26,100	Page 40, "Treatment of Disposal of Waste" (TD_02-5) Stormwater Treatment during closure activities
Subtotal Section 2		\$769,600	
Section 3. Sampling and Analysis			
Concrete/masonry sampling & analyses	D	\$20,300	Page 28, "Concrete Core Samples (SA_05-1) Coring Samples and Lab Analysis
Canopy fabric sampling & analyses	C	\$18,200	Page 30, "Surface Water and Liquid Samples (SA_07-1) Canopy Samples
Rinsate Samples associated with decontamination of metal surfaces	C	\$7,800	Page 34, "Soil, Sludge, and Sediment Samples (SA_08-2) Rinsate Samples
Soil vapor (VOC) sampling & analyses	D	\$6,500	Page 24, "Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes" (SA_03-2) VOC borings
Subgrade material sampling & analyses	D	\$76,600	Page 26, "Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes" (SA_03-1) Soil Borings
Sampling and analyses of soil adjacent to HWMU.	D	\$3,400	Page 32, "Soil, Sludge, and Sediment Samples" (SA_08-1) Surface perimeter sampling
Background soil sampling & analyses	D	\$4,600	Page 22, "Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes" (SA_03-3) Background Samples
Soil Sampling to Delineate Excavation Area	D	\$3,600	Page 20, "Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes" (SA_03-4) Excavation Samples
Post-Excavation Soil Sampling	D	\$500	Page 36, "Analysis of Subsurface Soil Samples" (SA_11-1) Excavation Samples
Subtotal Section 3		\$141,500	
Section 4. Excavation of Concrete and Soil			
Demolition, Removal, and Loading of Concrete	C	\$49,000	Page 4, "Demolition and Removal of Concrete Structures" (WP_05-1)
Excavation of Hazardous Waste Soil	C	\$800	Page 6, "Waste Piles Removal of Soil" (WP_06-1)
Excavation of Non-Hazardous Waste Soil	D	\$2,500	Page 5, "Waste Piles Removal of Soil" (WP_06-2)
Transportation of Concrete as a Non-Hazardous Waste	-	\$5,600	Page 51, "Transportation of Waste (TR_01-5)

Attachment J-2: CostPro© Worksheets

Phase 1 Closure Cost Estimate (Removal of Recyclable Material)

Phase 2 Closure Cost Estimate (HWMU Closure)

World Resources Company
AZD980735500

Address: 8113 West Sherman Street
Tolleson
ARIZONA
85358

Comments: 6/11/14--Closure Costs with a 10% Contingency.

Activity	Units	Closure Cost
Waste Piles	1	\$1,811,044.49

\$1,811,044.49

Additional Costs \$0.00

Total Estimated Cost **\$1,811,044.49**

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Summary (WP_02-1)

Removal of Waste (WP-03)	\$29,570.98	
Removal of Containment System Components (WP-04)	\$0.00	
Demolition and Removal of Concrete Structures (WP-05)	\$0.00	
Removal of Soil (WP-06)	\$0.00	
Backfill and Grading (BF-01)	\$0.00	
Decontamination (DC-01)	\$0.00	
Sampling and Analysis (SA-02)	\$0.00	
Monitoring Well Installation (MW-01)	\$0.00	
Transportation (TR-01)	\$530,160.00	
Treatment and Disposal (TD-01)	\$937,000.00	
User Defined Cost (UD-01)	\$0.00	
Subtotal of Closure Costs	\$1,496,730.98	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	\$149,673.10	
Certification of Closure (WP-07)	\$0.00	
Subtotal	\$1,646,404.08	
Percentage of Contingency Allowance	10.0	%
Contingency Allowance	\$164,640.41	
Landfill Closure (Cover Installation) (CI-02)	\$0.00	
TOTAL COST OF CLOSURE	\$1,811,044.49	

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Inventory (WP_01-1)

MAXIMUM PERMITTED CAPACITY

Volume of Waste	4,685.0	yd3
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SURFACE AREA OF GEOMEMBRANE LINER(S)

Length (Sum of all liners)	0.0	ft
Width (Sum of all liners)	0.0	ft
Area of Geomembrane Liner(s)	0.0	ft2

VOLUME OF DRAINAGE SYSTEM MATERIALS

Length (Sum of all layers)	0.0	ft
Width (Sum of all layers)	0.0	ft
Thickness (Sum of all layers)	0.0	ft
Volume of Drainage System Materials	0.0	ft3
Volume of Drainage System Materials in yd3	0.0	yd3

VOLUME OF CLAY COMPONENT OF BOTTOM COMPOSITE LINER

Length	0.0	ft
Width	0.0	ft
Thickness	0.0	ft
Volume of Clay Component of Bottom Composite Liner	0.0	ft3
Volume of Clay Component of Bottom Composite Liner in yd3	0.0	yd3

SURFACE AREA OF OTHER STRUCTURES

Surface Area of Other Structures	182,121.0	ft2
Surface Area of Other Structures in yd2	20,235.7	yd2

VOLUME OF OTHER STRUCTURES

Volume of Other Structures	200.0	yd3
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VOLUME OF LEACHATE

Volume of Leachate	0.0	gal
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VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Soil to be Removed	0.0	ft3
Volume of Soil to be Removed in yd3	0.0	yd3

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Removal of Waste (WP_03-1)

Maximum volume of waste to be removed from waste pile	4,685.0	yd3
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per work hour	\$188.04	per Work Hour
Work rate to remove one yd3	0.0330	Work hr per yd3
Number of hours required to remove waste	154.6	Work hrs
Subtotal of labor and equipment cost to remove waste	\$29,070.98	
Number of debris box containers needed to hold waste	235	Containers
Cost of one 20-yd3 -capacity debris box container (rent per week)	\$0.00	per Container
Cost of debris box containers	\$0.00	
Cost of mobilization and demobilization (flat rate)	\$500.00	
TOTAL COST OF REMOVAL OF WASTE	\$29,570.98	

Notes: Recyclable Material Loading. Crew B10T (R.S. Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity = 188.04/hr. Work rate (R.S. Means 2014) based on line #31 23 16.42 1500 using a wheel mounted 3/4 c.y. capacity bucket with a work rate of 0.033 labor hours/cy. Container rental costs are excluded from this worksheet under the assumption that recyclable material will be live loaded into trucks. Container costs are included in transportation worksheets.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	\$937,000.00
Treatment and Disposal of Decontamination Fluids (TD-03)	\$0.00
Total Cost of Treatment and Disposal	\$937,000.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	Waste Piles	
Volume in yd3 of solid waste to be treated and disposed of	4,685.0	yd3
Treatment and disposal costs per yd3	\$200.00	per yd3
Cost to Treat and Dispose of Solid Waste	\$937,000.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	0.0	gal
Treatment and disposal costs per gallon	\$0.05	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$0.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$937,000.00	

Notes: Recyclable Material Disposal. Assume 4685 cubic yards of recycled material will be disposed of as a hazardous waste. This is the maximum permitted amount of material that the facility may store. Treatment and disposal cost of 200.00 per cubic yard is a quote supplied by a hazardous waste disposal facility for average disposal cost for bulk hazardous waste solids.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-1)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	\$2,256.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	0.0	gal
Number of truckloads needed to transport bulk free liquid waste	0	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk liquids	\$2,256.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$0.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	235	Containers
Number of truckloads needed to transport bulk waste	235	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk waste	\$2,256.00	per Truckload
Cost to Transport Bulk Waste	\$530,160.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$530,160.00	

Notes: Recyclable Material Transportation. 4685 yd3 of recyclable material. Assuming 20 yd3 per truck = 235 trucks. Assumed transportation of material as a hazardous waste to a permitted TSD facility 400 miles from the site.

World Resources Company
AZD980735500

Address: 8113 West Sherman Street
Tolleson
ARIZONA
85358

Comments: 6/11/2014--Closure Costs with 20% Contingency

Activity	Units	Closure Cost
Waste Piles	1	\$1,671,295.12

\$1,671,295.12

Additional Costs \$0.00

Total Estimated Cost **\$1,671,295.12**

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Summary (WP_02-1)

Removal of Waste (WP-03)	\$0.00	
Removal of Containment System Components (WP-04)	\$0.00	
Demolition and Removal of Concrete Structures (WP-05)	\$49,009.36	
Removal of Soil (WP-06)	\$3,259.89	
Backfill and Grading (BF-01)	\$39,888.75	
Decontamination (DC-01)	\$517,927.10	
Sampling and Analysis (SA-02)	\$141,473.52	
Monitoring Well Installation (MW-01)	\$0.00	
Transportation (TR-01)	\$57,108.00	
Treatment and Disposal (TD-01)	\$268,461.75	
User Defined Cost (UD-01)	\$113,004.29	
Subtotal of Closure Costs	\$1,190,132.66	
Percentage of Engineering Expenses	10.0	%
Engineering Expenses	\$119,013.27	
Certification of Closure (WP-07)	\$83,600.00	
Subtotal	\$1,392,745.93	
Percentage of Contingency Allowance	20.0	%
Contingency Allowance	\$278,549.19	
Landfill Closure (Cover Installation) (CI-02)	\$0.00	
TOTAL COST OF CLOSURE	\$1,671,295.12	

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Inventory (WP_01-1)

MAXIMUM PERMITTED CAPACITY

Volume of Waste	4,685.0	yd3
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SURFACE AREA OF GEOMEMBRANE LINER(S)

Length (Sum of all liners)	0.0	ft
Width (Sum of all liners)	0.0	ft
Area of Geomembrane Liner(s)	0.0	ft2

VOLUME OF DRAINAGE SYSTEM MATERIALS

Length (Sum of all layers)	0.0	ft
Width (Sum of all layers)	0.0	ft
Thickness (Sum of all layers)	0.0	ft
Volume of Drainage System Materials	0.0	ft3
Volume of Drainage System Materials in yd3	0.0	yd3

VOLUME OF CLAY COMPONENT OF BOTTOM COMPOSITE LINER

Length	0.0	ft
Width	0.0	ft
Thickness	0.0	ft
Volume of Clay Component of Bottom Composite Liner	0.0	ft3
Volume of Clay Component of Bottom Composite Liner in yd3	0.0	yd3

SURFACE AREA OF OTHER STRUCTURES

Surface Area of Other Structures	182,121.0	ft2
Surface Area of Other Structures in yd2	20,235.7	yd2

VOLUME OF OTHER STRUCTURES

Volume of Other Structures	200.0	yd3
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VOLUME OF LEACHATE

Volume of Leachate	0.0	gal
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VOLUME OF CONTAMINATED SOIL TO BE REMOVED

Length	0.0	ft
Width	0.0	ft
Depth	0.0	ft
Volume of Soil to be Removed	0.0	ft3
Volume of Soil to be Removed in yd3	0.0	yd3

Demolition and Removal of Concrete Structures (WP_05-1)

DEMOLITION OF CONCRETE STRUCTURES

Area of structures	9,800.0	ft2
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per work hour	\$115.37	per Work Hour
Work rate required to demolish one ft2 of concrete structures	0.0300	Work hr per ft2
Number of hours required to demolish the structure	294.0	Work hrs
Cost to Demolish the Concrete Structures	\$33,918.78	

REMOVAL AND LOADING OF CONCRETE STRUCTURES

Volume of concrete structures	375.0	yd3
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per work hour	\$145.76	per Work Hour
Work rate required to remove one yd3	0.2670	Work hr per yd3
Number of hours required to remove the structures	100.1	Work hrs
Subtotal of labor and equipment cost to remove and load the concrete structures	\$14,590.58	
Number of debris box containers needed to hold concrete structures	19	Containers
Cost of one 20-yd3 -capacity debris box container (rent per week)	\$0.00	per Container
Cost of debris box containers	\$0.00	
Cost of mobilization and demobilization (flat rate)	\$500.00	
Cost to Remove and Load Concrete Structures	\$15,090.58	
TOTAL COST OF DEMOLITION AND REMOVAL OF CONCRETE STRUCTURES	\$49,009.36	

Notes: Hypothetical demolition and removal of concrete structures rate adjusted to 115.37 for B-39 crew (RS Means 2014) by assuming 55% labor productivity and 75% equipment productivity. Work rate per ft2 is based on 1400 sq ft/48 man hours=29.17 sq ft/man hr=0.03 man hr/sq ft. Removal and loading of concrete structures rate adjusted to 145.76/hr reflecting B-17 crew (RS Means 2014) by assuming 55% labor productivity and 75% equipment productivity. Work rate per ft2 is based on 120 cu yd/32 man hrs=3.75 cu yd/man hr=0.267 man hr/cu yd. Bin rental removed since live loading is assumed and included in B-17 crew.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Removal of Soil (WP_06-2)

Volume of contaminated soil to be removed	990.0	yd3
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per work hour	\$151.83	per Work Hour
Work rate required to remove one yd3	0.0130	Work hr per yd3
Number of hours required to remove soil	12.9	Work hrs
Cost to remove soil	\$1,958.61	
Number of debris box containers needed to hold soil	50	Containers
Cost of one 20-yd3 -capacity debris box container (rent per week)	\$0.00	per Container
Cost of debris box containers	\$0.00	
Cost of mobilization and demobilization	\$500.00	
TOTAL COST OF REMOVAL OF SOIL	\$2,458.61	

Notes: Hypothetical excavation of 90% of impacted soil (990 cy) as non-hazardous waste. Crew B-12B (RS Means 2014) adjusted to Level D PPE by assuming 82% labor productivity and 100% equipment productivity = 151.83/hr. Work rate based on line #31.23.16.42 5150 (RS Means 2014) using a crawler-mounted excavator with 1.5 cy capacity bucket at a work rate of 0.013 labor hrs per cy. Container rental costs are excluded under the assumption that soil will be live-loaded onto trucks.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Removal of Soil (WP_06-1)

Volume of contaminated soil to be removed	110.0	yd3
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per work hour	\$215.20	per Work Hour
Work rate required to remove one yd3	0.0130	Work hr per yd3
Number of hours required to remove soil	1.4	Work hrs
Cost to remove soil	\$301.28	
Number of debris box containers needed to hold soil	6	Containers
Cost of one 20-yd3 -capacity debris box container (rent per week)	\$0.00	per Container
Cost of debris box containers	\$0.00	
Cost of mobilization and demobilization	\$500.00	
TOTAL COST OF REMOVAL OF SOIL	\$801.28	

Notes: Hypothetical excavation of 10% of impacted soil (110 cy) as hazardous waste. Crew B-12B (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity = 215.20/hr. Work rate based on line #31.23.16.42 5150 (RS Means 2014) using a crawler-mounted excavator with 1.5 cy capacity bucket at a work rate of 0.013 labor hrs per cy. Container rental costs are excluded under the assumption that soil will be live-loaded onto trucks.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Certification of Closure (WP_07-3)

Number of units requiring certification of closure	1	Units
cost of certification of closure per unit	\$29,000.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	\$29,000.00	

Notes: Sampling report preparation- 160 hrs @ 120/hr (Senior Scientist) + 40 hrs @ 160/hr (Senior Engineer) + 40 hrs @ 85/hr (Admin).

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Certification of Closure (WP_07-2)

Number of units requiring certification of closure	1	Units
cost of certification of closure per unit	\$35,200.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	\$35,200.00	

Notes: Field observations/Reporting by P.E.- 220 hrs (10 hrs/week x 22 weeks) @ 160/hr (Senior Engineer).

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Waste Piles Certification of Closure (WP_07-1)

Number of units requiring certification of closure	1	Units
cost of certification of closure per unit	\$19,400.00	
TOTAL COST OF CERTIFICATION OF CLOSURE	\$19,400.00	

Notes: Final Closure Report Preparation- 100hrs (Senior Engineer/PE Review) @ 160/hr. 40hr (Admin) @ 85/hr.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Backfill and Grading Summary (BF_01-1)

Backfilling Excavated Areas (BF-02)	\$39,888.75
Grading to Provide Positive Slope (BF-03)	\$0.00
Backfilling Storage, Process, and Containment Pits (BF-04)	\$0.00
TOTAL COST OF BACKFILL AND GRADING	\$39,888.75

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Backfilling Excavated Areas (BF_02-1)

VOLUME OF EXCAVATED AREA

Volume	1,100.0	yd3
Compaction factor	0.2500	
Volume of additional fill required because of compaction factor	275.0	yd3
Total volume of fill needed	1,375.0	yd3

BACKFILL AREA

Labor, material, and equipment cost per yd3	\$29.01	per yd3
Subtotal of labor, material, and equipment cost to backfill	\$39,888.75	
Cost of mobilization and demobilization (flat rate)	\$0.00	
TOTAL COST OF BACKFILL	\$39,888.75	

Notes: Backfill cost is 17.50 per cubic yard (RS Means 2014 31.23.23.16.0020) plus 9.85 per cubic yard for hauling (RS Means 2014 31.23.23.20.9025) plus 1.66 per cubic yard for compaction (RS Means 2014 31.23.23.24.0030).

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Decontamination Summary (DC_01-1)

Decontamination of Unit by Steam Cleaning or Pressure Washing (DC-02)	\$511,418.75
Decontamination of Unit by Sandblasting (DC-03)	\$0.00
Decontamination of Heavy Equipment (DC-04)	\$6,508.35
TOTAL COST OF DECONTAMINATION	\$517,927.10

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Decontamination by Steam Cleaning or Pressure Wash (DC_02-4)

Area of unit to be decontaminated	187,000.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	\$132.97	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0019	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	355.3	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	\$47,244.24	
Ratio of decontamination fluid to area	0.8	gals per ft2
Volume of decontamination fluid generated	149,600.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	\$72.28	per Drum
Cost of drums needed to contain decontamination fluid	\$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	\$47,244.24	

Notes: Decontamination of Canopy (187000 sq. ft.). Crew B-12A (RS Means 2014) (66.38+56.55/hour) plus one additional laborer (56.55/hour) adjusted to Level D PPE by assuming 82% labor productivity and 100% equipment productivity = 132.97/hour. Decontamination fluid generation rate assumes three open-top boxes or tanks will be utilized as wash/rinse tanks (in series) with assumed decontamination fluid changeout of 12800 gallons of water each day. Work rate based on handling/decontamination of approximately 1600 sqft every 3 hours. Dismantlement of canopy costs are included on Worksheet UD_01-2.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Decontamination by Steam Cleaning or Pressure Wash (DC_02-1)

Area of unit to be decontaminated	182,121.0	ft2
Choose the appropriate level of PPE	Protection Level D	
Labor and equipment cost per hour	\$78.50	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0210	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	3,824.5	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	\$300,223.25	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	182,121.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	\$72.28	per Drum
Cost of drums needed to contain decontamination fluid	\$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	\$300,223.25	

Notes: Decontamination of HWMU Pad. RS Means Building Cost Guide (2014) line #04 01 30.20 0420 specifies an average daily rate labor rate of .021 labor hours/sq. ft. Standard CostPro decontamination fluid generation rate of 1 gals per sq. ft. is used. Crew C-29 (RS Means 2014) adjusted to Level D PPE by assuming 82% labor productivity and 100% equipment productivity.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Decontamination by Steam Cleaning or Pressure Wash (DC_02-2)

Area of unit to be decontaminated	10,400.0	ft2
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per hour	\$115.54	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0210	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	218.4	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	\$25,233.94	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	10,400.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	\$72.28	per Drum
Cost of drums needed to contain decontamination fluid	\$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	\$25,233.94	

Notes: Steam cleaning/pressure washing of TCU (5366 ft2) WEIMA Shredder (324 ft2) Prodeva Shredder (324 ft2) Blender (1468 ft2) and Control Room (~1234 ft2) two 5000 gallon Poly Agglomerating Tanks (435 x 2=870 ft2) and south wall of shop (800 ft2) = ~10400 ft2. RS Means Building Cost Guide (2014) line #04 01 30.20 0420 specifies an average daily rate labor rate of .021 labor hours/sq. ft. Standard CostPro decontamination fluid generation rate of 1 gals per sq. ft. is used. Crew C-29 (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity. Costs for dismantlement of TCU Shredders Blender and Agglomerating Tanks are included on Worksheet UD_01-1.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Decontamination by Steam Cleaning or Pressure Wash (DC_02-3)

Area of unit to be decontaminated	57,172.0	ft2
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per hour	\$115.54	per Work Hour
Work rate to steam clean or pressure wash one ft2	0.0210	Work hr per ft2
Number of hours required to steam clean or pressure wash the unit	1,200.6	Work hrs
Subtotal of labor and equipment costs to decontaminate unit by steam cleaning or pressure washing	\$138,717.32	
Ratio of decontamination fluid to area	1.0	gals per ft2
Volume of decontamination fluid generated	57,172.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	\$72.28	per Drum
Cost of drums needed to contain decontamination fluid	\$0.00	
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING	\$138,717.32	

Notes: Decontamination of WWTU and rental rolloff/frac tanks for wastewater and stormwater storage. Assumed 40000 sqft of surface for the WWTU 2080 sqft for 2-30 yard rolloff (interior and exterior) and 15092 sqft for 8-21000 gallon frac tanks totaling 57172 sqft. RS Means Cost Guide (2014) specifies an average work rate of 0.021 labor hours/sqft based on Line #04 01 30.20 0420. Standard CostPro decontamination fluid generation rate of 1 gals per sqft is used. Crew C-29 (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity.

Decontamination of Heavy Equipment (DC_04-1)

Number of hours needed to decontaminate all heavy equipment	30.0	Work hrs
Cost of steam cleaner rental per hour	\$0.00	per Hour
Subtotal of steam cleaner rental costs	\$0.00	
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per hour	\$115.54	per Work Hour
Subtotal of labor costs to decontaminate by steam cleaning	\$3,466.20	
Ratio of decontamination fluid to hour	100.0	gals per hr
Volume of decontamination fluid generated	3,000.0	gal
Decontamination fluid container type:	Bulk	
Number of drums required to contain decontamination fluid for removal	0	Drums
Cost of one drum	\$72.28	per Drum
Cost of drums needed to contain decontamination fluid	\$0.00	
Cost of construction of temporary decontamination area for heavy equipment.	\$1,983.53	
Cost of demolition of temporary decontamination area for heavy equipment.	\$1,058.62	
TOTAL COST OF DECONTAMINATION OF HEAVY EQUIPMENT	\$6,508.35	

Notes: Assumed decontamination of 3 front end loaders (3 hours each) and 1 forklift (1 hour) after removal of the recyclable materials from the pad. Assumed decontamination of 2 manlifts (3 hours each) and 1 telescoping crane (3 hours) after dismantling canopy. Assumed decontamination of 1 front end loader (3 hours) and 2 forklifts (1 hour each) after dismantling the canopy and TCU/Shredder/Blender. This results in a total equipment decontamination time of 24 hours. Crew C-29 (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity. For concrete removal/soil excavation assumed 3 hours to decon a hydraulic excavator used during soil excavation and 3 hours to decon a front end loader used to load concrete/soil.

Sampling and Analysis Inventory (SA_01-1)

Number of Drilling and Subsurface Soil Samples (2.5-inch boring)	80	Samples
Number of Drilling and Subsurface Soil Samples (4-inch boring)	0	Samples
Number of Concrete Core Samples	52	Samples
Number of Wipe Sample Locations	0	Sample Location
Number of Surface Water and Liquid Sample Locations	0	Sample Location
Number of Soil, Sludge, and Sediment Soil Samples	8	Sample Location
Number of Groundwater Sample Locations	0	Sample Location
Number of Lysimeters to be Sampled	0	Lysimeters

Notes: Number of 2.5-inch drill holes will be 80 based on 22 random/30 biased/10 background plus 18 soil vapor locations. Concrete core samples to be collected at both random and biased locations. Five soil samples to be collected from each biased and random boring location (52 locations x 5 soil samples = 260 soil samples) plus one soil sample from each background location (10 soil samples). One near-surface soil sample from each perimeter location (8 soil samples).

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Sampling and Analysis Summary (SA_02-1)

Drilling and Subsurface Soil Sample - 2.5-Inch-Diameter-Holes (SA-03)	\$91,305.70
Drilling and Subsurface Soil Sample - 4-Inch-Diameter-Holes (SA- 04)	\$0.00
Concrete Core Sample (SA-05)	\$20,319.80
Wipe Sample (SA-06)	\$0.00
Surface Water and Liquid Sample (SA-07)	\$18,182.50
Soil, Sludge, and Sediment Sample (SA-08)	\$11,198.70
Groundwater Sample (SA-09)	\$0.00
Soil-Pore Liquid Sample (SA-10)	\$0.00
Analysis of Subsurface Soil Sample (SA-11)	\$466.82
TOTAL SAMPLING AND ANALYSIS COST	\$141,473.52

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-4)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	10	Borings
Enter depth of boreholes (sum of all)	80	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	\$300.00	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.1000	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	8.0	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	\$2,400.00	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	\$1,235.70	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES	\$3,635.70	
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES PER EVENT	\$3,635.70	per Event

Notes: Additional sampling associated with concrete removal/soil excavation. CostPro does not provide an option for Geoprobe work to be completed. Labor and equipment cost per work hour modified to 300.00/hr to reflect local Geoprobe rates. Work rate to drill 2.5 inch-diameter hole modified to .01 work hr per ft to reflect average rate of 10 ft per hour. Included in the labor and equipment rate is 2-3 laborers drill rig drums for cuttings bentonite chips for backfill. Analytical costs are summarized on the following page. Analytical costs include 40 samples (10 borings to 8 feet 2 foot sample intervals) + 4 duplicates + 1 Equipment blank each for 2 Metals analysis.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Metals (SW 6010), per each metal	Both	\$13.73	90	\$27.46	0	\$1,235.70

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-3)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	10	Borings
Enter depth of boreholes (sum of all)	120	ft
Choose the appropriate drilling method	Auger Boring - Level C	
Labor and equipment cost per work hour	\$300.00	per Work Hour
Choose the appropriate drilling method	Cased Borings 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.0500	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	6.0	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	\$1,800.00	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	\$2,820.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES	\$4,620.00	
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES PER EVENT	\$4,620.00	per Event

Notes: HWMU Background Soil Samples-10 Geoprobe borings to maximum depth of 12 feet bgs. 120 feet of total drilling footage. 11 soil samples (10 locations x 1 samples per locations=10 + 1 duplicates=11. CostPro does not provide an option for Geoprobe work to be completed. Labor and equipment cost per work hour modified to 300.00/hr to reflect local Geoprobe rates. Work rate to drill 2.5 inch-diameter hole modified to .05 work hr per ft to reflect average rate of 20 ft per hour. Included in the labor and equipment rate is 2-3 laborers drill rig drums for cuttings bentonite chips for backfill. Labor and Equipment Cost per hour also applicable for soil vapor survey activities and includes personnel equipment and supplies needed. Analytical costs are summarized on the following page.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)

Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Cyanide (SW 9010) with prep	Liquid	\$75.00	12	\$97.68	0	\$900.00
Mercury, cold vapor (SW 7470) with prep	Liquid	\$28.00	12	\$82.40	0	\$336.00
TAL metals (SW 6010/7000s)	Both	\$132.00	12	\$596.72	0	\$1,584.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-2)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	18	Borings
Enter depth of boreholes (sum of all)	180	ft
Choose the appropriate drilling method	Auger Boring - Level C	
Labor and equipment cost per work hour	\$300.00	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.0500	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	9.0	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	\$2,700.00	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	\$3,780.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES	\$6,480.00	
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES PER EVENT	\$6,480.00	per Event

Notes: Soil Vapor Sampling and Analysis-CostPro does not provide an option for Geoprobe work to be completed. Labor and equipment cost per work hour modified to 300.00/hr to reflect local Geoprobe rates. Work rate to drill 2.5 inch-diameter hole modified to .05 work hr per ft to reflect average rate of 20 ft per hour. Included in the labor and equipment rate is 2-3 laborers drill rig drums for cuttings bentonite chips for backfill. Labor and Equipment Cost per hour also applicable for soil vapor survey activities and includes personnel equipment and supplies needed. Analytical costs are summarized on the following page.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)

Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Volatile organic analysis (SW 5030/SW 8240)	Both	\$180.00	21	\$377.66	0	\$3,780.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03-1)

DRILLING AND SUBSURFACE SOIL SAMPLE COSTS - 2.5-INCH-DIAMETER-HOLES

Number of borings to be drilled	52	Borings
Enter depth of boreholes (sum of all)	624	ft
Choose the appropriate drilling method	Auger Boring - Level D	
Labor and equipment cost per work hour	\$300.00	per Work Hour
Choose the appropriate drilling method	Hollow-Stem Auger 2.5-Inch	
Work rate to drill 2.5-inch-diameter hole	0.0500	Work hr per Ft
Number of hours required to drill 2.5-inch diameter hole	31.2	Work hrs
Cost of Drilling 2.5-Inch Borings per Sampling Event	\$9,360.00	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	\$67,210.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES	\$76,570.00	
TOTAL COST OF S&A OF DRILLING AND SUBSURFACE SOIL SAMPLES PER EVENT	\$76,570.00	per Event

Notes: HWMU Random/Biased Soil Samples-52 Geoprobe borings to maximum depth of 12 feet bgs. 624 feet of total drilling footage. 273 soil samples (52 locations x 5 samples per locations=260 + 13 duplicates=273. CostPro does not provide an option for Geoprobe work to be completed. Labor and equipment cost per work hour modified to 300.00/hr to reflect local Geoprobe rates. Work rate to drill 2.5 inch-diameter hole modified to .05 work hr per ft to reflect average rate of 20 ft per hour. Included in the labor and equipment rate is 2-3 laborers drill rig drums for cuttings bentonite chips for backfill. Labor and Equipment Cost per hour also applicable for soil vapor survey activities and includes personnel equipment and supplies needed. Analytical costs are summarized on the following page.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Drilling and Subsurface Soil Samples - 2.5-Inch-Diameter-Holes (SA_03)

Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Cyanide (SW 9010)	Both	\$75.00	286	\$109.86	0	\$21,450.00
Mercury, cold vapor (SW 7470) with prep	Liquid	\$28.00	286	\$82.40	0	\$8,008.00
TAL metals (SW 6010/7000s)	Both	\$132.00	286	\$596.72	0	\$37,752.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Concrete Core Samples (SA_05-1)

COLLECTION OF CORE SAMPLES

Number of corings to be drilled	52	Coring Samples
Choose the appropriate level of PPE		Protection Level C
Labor and equipment cost per work hour	\$128.65	per Work Hour
Work rate to drill each core sample to a 6-inch depth	1.0000	Work hrs per Sample
Number of hours required to drill 3-inch-diameter boring	52.0	Work hrs
Cost of Collection per Sampling Event	\$6,689.80	per Event

ANALYSIS OF DRILLING SAMPLE

Cost of Analysis per Sampling Event	\$13,630.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events per yr
TOTAL COST OF SAMPLING AND ANALYSIS OF CORE SAMPLES	\$20,319.80	

Notes: Concrete Sampling and Analysis-Concrete cores from 30 biased and 22 random locations. Analyses of 52 concrete samples plus 3 duplicates and 3 rinse blanks. Crew B-89A (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity = 128.65 per hour. Work rate (1 hour per sample) is for collection of 3-inch diameter cores from 6-inch reinforced concrete slab. Analytical costs are summarized on the following page.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Concrete Core Samples (SA_05)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Cyanide (SW 9010)	Both	\$75.00	58	\$109.86	0	\$4,350.00
Mercury, cold vapor (SW 7470) with prep	Liquid	\$28.00	58	\$82.40	0	\$1,624.00
TAL metals (SW 6010/7000s)	Both	\$132.00	58	\$596.72	0	\$7,656.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Surface Water and Liquid Samples (SA_07-1)

COLLECTION OF SURFACE WATER AND LIQUID SAMPLES

Number of sampling locations	50	Sample Location
Choose the appropriate level of PPE		Protection Level C
Labor and equipment cost per work hour	\$128.65	per Work Hour
Work rate required to collect samples from one sampling location	1.0000	Work hrs per Sample
Number of hours required to collect all samples	50.0	Work hrs
Cost of Collection per Sampling Event	\$6,432.50	per Event

ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES

Cost of Analysis per Sampling Event	\$11,750.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SURFACE WATER AND LIQUID SAMPLES	\$18,182.50	

Notes: Collection and analyses of 40 canopy fabric samples plus 10 split samples = 50 samples total.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Surface Water and Liquid Samples (SA_07)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Cyanide (SW 9010) with prep	Liquid	\$75.00	50	\$97.68	0	\$3,750.00
Mercury, cold vapor (SW 7470) with prep	Liquid	\$28.00	50	\$82.40	0	\$1,400.00
TAL metals (SW 6010/7000s)	Both	\$132.00	50	\$596.72	0	\$6,600.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Soil, Sludge, and Sediment Samples (SA_08-1)

COLLECTION OF SOIL, SLUDGE, AND SEDIMENT SAMPLES

Number of sampling locations	8	Sample Location
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per work hour	\$128.65	per Work Hour
Work rate required to collect samples from one sampling location	1.0000	Work hrs per Sample
Number of hours required to collect all samples	8.0	Work hrs
Cost of Collection per Sampling Event	\$1,029.20	per Event

ANALYSIS OF SOIL, SLUDGE, AND SEDIMENT SAMPLES

Cost of Analysis per Sampling Event	\$2,350.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SOIL, SLUDGE, AND SEDIMENT SAMPLES	\$3,379.20	

Notes: Soils Adjacent to the HWMU- 8 sample locations + 1 duplicate= 9 samples for analysis. 1 rinse sample for QA/QC. Assumed Crew B-89A (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity = 128.65 per hour. Analytical costs are summarized on the following page.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Soil, Sludge, and Sediment Samples (SA_08)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
Cyanide (SW 9010)	Both	\$75.00	10	\$109.86	0	\$750.00
Mercury, cold vapor (SW 7470) with prep	Liquid	\$28.00	10	\$82.40	0	\$280.00
TAL metals (SW 6010/7000s)	Both	\$132.00	10	\$596.72	0	\$1,320.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Soil, Sludge, and Sediment Samples (SA_08-2)

COLLECTION OF SOIL, SLUDGE, AND SEDIMENT SAMPLES

Number of sampling locations	30	Sample Location
Choose the appropriate level of PPE	Protection Level C	
Labor and equipment cost per work hour	\$128.65	per Work Hour
Work rate required to collect samples from one sampling location	1.0000	Work hrs per Sample
Number of hours required to collect all samples	30.0	Work hrs
Cost of Collection per Sampling Event	\$3,859.50	per Event

ANALYSIS OF SOIL, SLUDGE, AND SEDIMENT SAMPLES

Cost of Analysis per Sampling Event	\$3,960.00	per Event
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SAMPLING EVENTS

Number of sampling events	1	Events
TOTAL COST OF SAMPLING AND ANALYSIS OF SOIL, SLUDGE, AND SEDIMENT SAMPLES	\$7,819.50	

Notes: Collection of 20 rinsate samples plus 10 split samples associated with decontamination of metal surfaces.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Soil, Sludge, and Sediment Samples (SA_08)
Cost of Analysis per Sampling Event

Method		Standard	Qty	Quick	Qty	Total
TAL metals (SW 6010/7000s)	Both	\$132.00	30	\$596.72	0	\$3,960.00

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Analysis of Subsurface Soil Samples (SA_11-1)

ANALYSIS OF SUBSURFACE SOIL SAMPLES

Enter the number of sampling events	1	Events
Cost of analysis per sampling event for subsurface soil sample	\$466.82	per Event
TOTAL COST OF ANALYSIS OF SUBSURFACE SOIL SAMPLES	\$466.82	

Notes: 15 post excavation grab samples + 1 duplicate sample + 1 equipment blank for analysis for 2 metals per sample.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Analysis of Subsurface Soil Samples (SA_11)

Cost of analysis per sampling event for subsurface soil sample

Method		Standard	Qty	Quick	Qty	Total
Metals (SW 6010), per each metal	Both	\$13.73	34	\$27.46	0	\$466.82

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal Summary (TD_01-1)

Treatment and Disposal of Wastes (TD-02)	\$268,461.75
Treatment and Disposal of Decontamination Fluids (TD-03)	\$0.00
Total Cost of Treatment and Disposal	\$268,461.75

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-3)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	TCU/Shredder/Blender	
Volume in yd3 of solid waste to be treated and disposed of	100.0	yd3
Treatment and disposal costs per yd3	\$101.26	per yd3
Cost to Treat and Dispose of Solid Waste	\$10,126.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	Decon Water	
Volume in gallons of liquid waste to be treated and disposed of	10,400.0	gal
Treatment and disposal costs per gallon	\$0.05	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$520.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$10,646.00	

Notes: TCU/Shredders/Blender/Control Room/Agglomerating Tanks/South Wall of Shop. Assumed disposal as a non-hazardous waste after decontamination. Treatment of 10400 gallons of decontamination water in on-site WWTU at an estimated cost of 0.05 per gallon.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-5)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	0	
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	\$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	\$0.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	Storm Water	
Volume in gallons of liquid waste to be treated and disposed of	522,238.0	gal
Treatment and disposal costs per gallon	\$0.05	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$26,111.90	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$26,111.90	

Notes: Stormwater Treatment. Assumed 522238 gallons of storm water collected over a 6 month period of closure. Storm water will be treated in the on-site WWTU at an estimated cost of 0.05 per gallon.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-1)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	0	
Volume in yd3 of solid waste to be treated and disposed of	0.0	yd3
Treatment and disposal costs per yd3	\$0.00	per yd3
Cost to Treat and Dispose of Solid Waste	\$0.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	Pad Decon Water	
Volume in gallons of liquid waste to be treated and disposed of	182,121.0	gal
Treatment and disposal costs per gallon	\$0.05	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$9,106.05	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$9,106.05	

Notes: Pad Decontamination Water Treatment. Concrete pad decontamination water treated on-site at WWTU at a cost of 0.05 per gallon.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-7)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	Soil-Haz	
Volume in yd3 of solid waste to be treated and disposed of	110.0	yd3
Treatment and disposal costs per yd3	\$200.00	per yd3
Cost to Treat and Dispose of Solid Waste	\$22,000.00	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	0.0	gal
Treatment and disposal costs per gallon	\$0.00	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$0.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$22,000.00	

Notes: Hypothetical hazardous waste soil disposal. Assumed 10% (110 c.y.) of soil is sent to a hazardous waste landfill.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-4)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	Canopy	
Volume in yd3 of solid waste to be treated and disposed of	195.0	yd3
Treatment and disposal costs per yd3	\$101.26	per yd3
Cost to Treat and Dispose of Solid Waste	\$19,745.70	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	Canopy Decon	
Volume in gallons of liquid waste to be treated and disposed of	149,600.0	gal
Treatment and disposal costs per gallon	\$0.05	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$7,480.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$27,225.70	

Notes: Canopy and Supports. Assumed entire canopy and supports will consist of 13 loads at 15 cubic yards per load. This is post decontamination and the canopy will be handled as non-hazardous waste. Canopy decontamination water treated at on-site WWTU at an estimated cost of 0.05 per gallon.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-9)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	Concrete-Non haz	
Volume in yd3 of solid waste to be treated and disposed of	375.0	yd3
Treatment and disposal costs per yd3	\$101.26	per yd3
Cost to Treat and Dispose of Solid Waste	\$37,972.50	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	0.0	gal
Treatment and disposal costs per gallon	\$0.00	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$0.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$37,972.50	

Notes: Hypothetical concrete disposal. 375 cy of concrete disposed of as non-hazardous waste.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-2)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	WWTU Sludge/Piping	
Volume in yd3 of solid waste to be treated and disposed of	45.0	yd3
Treatment and disposal costs per yd3	\$185.44	per yd3
Cost to Treat and Dispose of Solid Waste	\$8,344.80	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	WWTU Decon	
Volume in gallons of liquid waste to be treated and disposed of	59,572.0	gal
Treatment and disposal costs per gallon	\$0.45	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$26,807.40	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$35,152.20	

Notes: WWTU Decontamination Water Sludge and Piping Disposal. Assumed two (2) 15-yd boxes of WWT sludge and one (1) 15-yd box of piping will be disposed of as a hazardous waste. Assumed 57172 gallons of WWTU decontamination water generated during WWTU decommissioning and sent off-site for treatment/disposal as a hazardous waste. An additional 2400 gallons of heavy equipment decontamination water is sent off-site for treatment disposal as a hazardous waste.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Treatment and Disposal of Waste (TD_02-8)

SOLID WASTE TREATMENT AND DISPOSAL

Solid Waste Type (Optional: Enter Name)	Soil-Non Haz	
Volume in yd3 of solid waste to be treated and disposed of	990.0	yd3
Treatment and disposal costs per yd3	\$101.26	per yd3
Cost to Treat and Dispose of Solid Waste	\$100,247.40	

LIQUID WASTE TREATMENT AND DISPOSAL

Liquid Waste Type (Optional: Enter Name)	0	
Volume in gallons of liquid waste to be treated and disposed of	0.0	gal
Treatment and disposal costs per gallon	\$0.00	per Gallon
Cost to Treat and Dispose of Liquid Waste	\$0.00	

DRUMMED WASTE TREATMENT AND DISPOSAL

Drummed Waste Type (Optional: Enter Name)	0	
Number of drums to be treated and disposed of	0	Drums
Treatment and disposal costs per drum	\$0.00	per Drum
Cost to Treat and Dispose of Drummed Waste	\$0.00	
TOTAL COST FOR TREATMENT AND DISPOSAL OF WASTE	\$100,247.40	

Notes: Hypothetical non-hazardous waste soil disposal. Assumed 90% (990 c.y.) of soil is sent to a non-hazardous waste landfill.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-7)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste	Non-Hazardous	
Number of miles	50.0	Mi
Cost per mile	\$2.00	per Mile
Cost to transport one truckload of 55-gallon drums	\$100.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	0.0	gal
Number of truckloads needed to transport bulk free liquid waste	0	Truckloads
Type of waste	Non-Hazardous	
Number of miles	300.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk liquids	\$1,692.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$0.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	50	Containers
Number of truckloads needed to transport bulk waste	50	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of bulk waste	\$150.00	per Truckload
Cost to Transport Bulk Waste	\$7,500.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$7,500.00	

Notes: Hypothetical non-hazardous waste soil transportation. Assumed 90% of excavated soil (990 cy) is transported as a non-hazardous waste. Assuming 20 c.y. per truck = 50 truckloads. Assumed non-hazardous disposal facility is 60 miles from the site.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-6)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste		Hazardous
Number of miles	300.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	\$1,692.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	0.0	gal
Number of truckloads needed to transport bulk free liquid waste	0	Truckloads
Type of waste		Hazardous
Number of miles	300.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk liquids	\$1,692.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$0.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	6	Containers
Number of truckloads needed to transport bulk waste	6	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk waste	\$2,256.00	per Truckload
Cost to Transport Bulk Waste	\$13,536.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$13,536.00	

Notes: Hypothetical hazardous waste soil transportation. Assumed 10% of excavated soil (110 cy) is transported as a hazardous waste. Assuming 20 c.y. per truck = 6 truckloads. Assumed transportation of material as a hazardous waste to a permitted TSD facility 400 miles from the site.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-2)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	\$2,256.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	59,572.0	gal
Number of truckloads needed to transport bulk free liquid waste	9	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk liquids	\$2,256.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$20,304.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	3	Containers
Number of truckloads needed to transport bulk waste	3	Truckloads
Type of waste		Hazardous
Number of miles	400.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk waste	\$2,256.00	per Truckload
Cost to Transport Bulk Waste	\$6,768.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$27,072.00	

Notes: WWTU Decontamination Sludge and Piping Transportation. Assumed 2 roll-off boxes of WWTU sludge and 1 roll-off box of piping will be generated during the duration of the project. Assumed 57172 gallons of WWTU decontamination water plus 2400 gallons of heavy equipment decontamination water will be transported off-site as a hazardous waste to a permitted TSD facility 400 miles from the site.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-3)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of 55-gallon drums	\$150.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	0.0	gal
Number of truckloads needed to transport bulk free liquid waste	0	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of bulk liquids	\$150.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$0.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	10	Containers
Number of truckloads needed to transport bulk waste	10	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of bulk waste	\$150.00	per Truckload
Cost to Transport Bulk Waste	\$1,500.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$1,500.00	

Notes: Transportation of Dismantled TCU/Blenders/Shredder/Control Room/Agglomerating Tanks to non-hazardous waste landfill. Assumed non-hazardous disposal facility is 60 miles from the site.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-8)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste		Hazardous
Number of miles	300.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of 55-gallon drums	\$1,692.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	0.0	gal
Number of truckloads needed to transport bulk free liquid waste	0	Truckloads
Type of waste		Hazardous
Number of miles	300.0	Mi
Cost per mile	\$5.64	per Mile
Cost to transport one truckload of bulk liquids	\$1,692.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$0.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	37	Containers
Number of truckloads needed to transport bulk waste	37	Truckloads
Type of waste		Hazardous
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of bulk waste	\$150.00	per Truckload
Cost to Transport Bulk Waste	\$5,550.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$5,550.00	

Notes: Hypothetical non-hazardous waste concrete transportation. Assumed concrete (37 truckloads) is transported as a non-hazardous waste. Assumed non-hazardous disposal facility is 60 miles from the site.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

Transportation of Waste (TR_01-4)

TRANSPORTATION OF WASTE IN DRUMS

Number of drums of waste	0	Drums
Number of truckloads needed to transport waste in drums	0	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of 55-gallon drums	\$150.00	per Truckload
Cost to Transport Waste in Drums	\$0.00	

TRANSPORTATION OF BULK LIQUID

Gallons of liquid waste	0.0	gal
Number of truckloads needed to transport bulk free liquid waste	0	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of bulk liquids	\$150.00	per Truckload
Cost to Transport Bulk Liquid Wastes	\$0.00	

TRANSPORTATION OF BULK WASTE

Number of waste debris boxes	13	Containers
Number of truckloads needed to transport bulk waste	13	Truckloads
Type of waste	Non-Hazardous	
Number of miles	60.0	Mi
Cost per mile	\$2.50	per Mile
Cost to transport one truckload of bulk waste	\$150.00	per Truckload
Cost to Transport Bulk Waste	\$1,950.00	
TOTAL COST OF TRANSPORTATION OF WASTE	\$1,950.00	

Notes: Transportation of Canopy & Supports (13 loads) to non-hazardous waste disposal facility.
Assumed non-hazardous disposal facility is 60 miles from the site.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

User Defined Activity (UD_01-1)

NAME OF CLOSURE OR POST-CLOSURE ACTIVITY	Dismantle TCU/Shredders/ Blender	
Number of units of work to be performed	2,305	
Type of unit		Tons
Appropriate level of PPE		Protection Level D
Labor, material, and equipment cost per work hour	\$138.69	
Work rate to perform one unit of activity	0.1423	Work hrs per Unit
Number of hours required to perform activity	328.0	Work hrs
Additional cost per unit	\$0.00	per Unit
Cost to conduct activity	\$45,490.32	

Other cost(s) associated with this activity

Description of other costs	Crane (2 days)
Cost	\$3,700.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
TOTAL COST OF USER DEFINED ACTIVITY	\$49,190.32

Notes: Dismantle TCU Blender Shredders Agglomerating Tanks prior to decontamination. Dismantlement costs based on Crew E-25 (RS Means 2014) adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity. Assumed two welders with cutting torches and two laborers. Assumed 328 work hours required to complete dismantlement. Crane rental for 2-days at 1850/day. Crane and crane crew costs based on Crew A-3I (RS Means 2014) adjusted to Level D PPE by assuming 82% labor productivity and 100% equipment productivity. Crane to be set up outside HWMU so that only decontamination of hook and cable will be required.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

User Defined Activity (UD_01-3)

NAME OF CLOSURE OR POST-CLOSURE ACTIVITY	Dry Sweep	
Number of units of work to be performed	182,121	
Type of unit	Tons	
Appropriate level of PPE	Protection Level C	
Labor, material, and equipment cost per work hour	\$256.81	
Work rate to perform one unit of activity	0.0001	Work hrs per Unit
Number of hours required to perform activity	18.2	Work hrs
Additional cost per unit	\$0.00	per Unit
Cost to conduct activity	\$4,673.94	

Other cost(s) associated with this activity

Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
TOTAL COST OF USER DEFINED ACTIVITY	\$4,673.94

Notes: Dry sweep costs based on 1 equipment operator (EQMD) and road sweeper adjusted to Level C PPE by assuming 55% labor productivity and 75% equipment productivity=256.81 per hour. Assumed work rate of 0.0001 hours per square foot (10000 square foot per hour).

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

User Defined Activity (UD_01-4)

NAME OF CLOSURE OR POST-CLOSURE ACTIVITY	Concrete Patching and Repair	
Number of units of work to be performed	1,821	
Type of unit	Tons	
Appropriate level of PPE	Protection Level D	
Labor, material, and equipment cost per work hour	\$87.19	
Work rate to perform one unit of activity	0.0800	Work hrs per Unit
Number of hours required to perform activity	145.7	Work hrs
Additional cost per unit	\$0.00	per Unit
Cost to conduct activity	\$12,703.58	
Other cost(s) associated with this activity		
Description of other costs	0	
Cost	\$0.00	
Description of other costs	0	
Cost	\$0.00	
Description of other costs	0	
Cost	\$0.00	
Description of other costs	0	
Cost	\$0.00	
Description of other costs	0	
Cost	\$0.00	
TOTAL COST OF USER DEFINED ACTIVITY	\$12,703.58	

Notes: Concrete Patch/Repair- 1 Cement Finishing (Cefi) Crew (line #03 01 30.62 Concrete Patching 2014 RS Means). Assume 1% of the HWMU Pad will require sealing/patching- 182121 ft² x .01=1821 ft². Labor and materials adjusted to Level D PPE by assuming 82% labor productivity and 100% equipment productivity. Sealant or epoxy such as ChemTech One Duromar and/or Sikadur (or equivalent) will be used.

Facility: World Resources
Company

Unit: Hazardous Waste
Management Unit (HWMU)

06/11/2014

User Defined Activity (UD_01-2)

NAME OF CLOSURE OR POST-CLOSURE ACTIVITY	dismantle canopy and structure	
Number of units of work to be performed	186,966	
Type of unit	Tons	
Appropriate level of PPE	Protection Level	D
Labor, material, and equipment cost per work hour	\$81.98	
Work rate to perform one unit of activity	0.0025	Work hrs per Unit
Number of hours required to perform activity	467.4	Work hrs
Additional cost per unit	\$0.00	per Unit
Cost to conduct activity	\$38,317.45	

Other cost(s) associated with this activity

Description of other costs	Inner Support Column Removal
Cost	\$3,547.00
Description of other costs	Outer Support Columns
Cost	\$4,572.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
Description of other costs	0
Cost	\$0.00
TOTAL COST OF USER DEFINED ACTIVITY	\$46,436.45

Notes: Dismantle Canopy and Supports. Demolition cost includes 1 labor foreman 3 laborers and a scissor lift (RS Means 2014) adjusted to Level D PPE by assuming 82% labor productivity and 100% equipment productivity. Dismantlement of 55 inner supports at a cost of 64.50 each (RS Means line #05 05 05.10-0230) and 36 outer supports at a cost of 127.00 each (RS Means line #05 05 05.10-0240).