APPENDIX R

Remedy Capital/O&M Costing

APPENDIX R
LIFE CYCLE COST ESTIMATES FOR REMEDY ALTERNATIVES

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Table R-1
Costs for Alternative No. 1 -- No Response Action
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost	Total Cost	Assumptions
	Assumed Production Rates					
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Months	**General Activities**					
0	Project Services	0	months	$50,000	$0	
	Surveying & Legal Costs	0	LS	$50,000	$0	
	Mobilization @ 5% of Construction Costs	0	LS	$0.00	$0	
	Clearing and Grubbing	2	Acre	$0.00	$0	
	Health and Safety	0	work days	$1,400	$0	
	Air Monitoring	0	work days	$1,900	$0	
	QA/QC	0	work days	$2,100	$0	
	Site Water Management	0	gal	$0.10	$0	
	Backfill, Grade and Seed	0	cy	$5	$0	
	Demobilization	1	LS	$0.00	$0	
	Survey	1	LS	$0.00	$0	
	Replace Perimeter Fence	0	linear ft	$20	$0	
	Subtotal General Activities				$0	
	Contingency @ 5% of Total Costs	1	LS	$0.00	$0	
	Total Estimated Costs				**$0**	
	Total Cost				**$0**	

Assumptions

1	No Waste Removal Off City Parcel
2	No Waste Materials Will Be Removed From The Site
3	Ongoing Emissions From the Site in its Current Condition Will Not Affect 3rd Party Actions
4	Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
5	Asssumes that Remaining Pit Materials Can Be Left Onsite
6	Assumes Final Agreement will Include Land Use Restrictions, Fencing and Restricted Entry
7	No Redevelopment Will Occur After Remedy Completion
8	Does not Include the Following Costs: O M & M, Inspections, Groundwater Remediation (If Required)

Table R-2
Costs for Alternative 2 - Limited Waste Removal
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost[(1)]	Total Cost	Assumptions
	Assumed Production Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (days)	**Remove Lagoon 1, 2, and 3 Tars & Incinerate by Fuel Blending, Remove Pit F, and Dispose Offsite (Sprung Structure Required)**					**Comments**
16	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	2,062,000	gal	$1.25	$2,578,000	Pump Lagoon Tarry Liquids and Incinerate by Fuel Blending (10% Volume Increase)
20	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	2,546,000	gal	$1.25	$3,183,000	Same as above
8	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	1,048,000	gal	$1.25	$1,310,000	Same as above
66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose of All Pit F Materials in an Offsite Landfill
	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
110	**Sub-Total**	**69,000**	cy		**$10,273,000**	
	***In situ* Cement Stabilization of Lagoon Materials Before Backfilling**	**Backfill Lagoons 1-3; Add 4 Foot Soil Layer over Lagoons**				**Comments**
64	Stabilize Lagoon 1 to 3 Before Covering	40,000	cy	$35	1,400,000	Use Cement Admixture to Stabilize 5 Feet Deep Over 5 Acres
64	Stabilize Lagoon 4 and 5 Before Covering	40,000	cy	$35	1,400,000	Use Cement Admixture to Stabilize 5 Feet Deep Over 5 Acres
	Vapor Control for Lagoon Stabilization	129	day	$1,175	152,000	Provide 2 Man Crew Plus Pump and Chemicals
	VOC Contaminated (Rule 1166) Wastes Generated During Site Grading	3,100	cy	$72	$223,000	Disposal as Cal Haz Waste
	VOC Contaminated (Rule 1166) Wastes Generated During Site Grading	3,100	cy	$81	$251,000	Disposal as Non Haz Waste
128	**Sub-Total**				**$3,175,000**	
238	**Total Construction**	**75,000**	**cy**		**$13,448,000**	

Table R-2
Costs for Alternative 2 - Limited Waste Removal
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost[(1)]	Total Cost	Assumptions
Additional Construction Time	**General Activities**	**Purchase Property and Manage Construction Activities**				**Comments**
	Purchase Easement	1	ls	$1,650,000	$1,650,000	
14 Months	Project Services	16	months	$113,000	$1,808,000	Add 10% for Rain Days
	Design & Permitting @ 15% of Construction Cost	1	LS	$2,017,000	$2,017,000	Final Design for Removal Actions
	Mobilization @ 5% of Construction Costs	1	LS	$672,333	$672,000	
	Clearing and Grubbing	19	Acre	$2,200	$42,000	Clear Top Surface of Site Only, Not Slopes
	Health and Safety	336	work days	$1,400	$470,000	
	Air Monitoring	336	work days	$1,900	$638,000	
	QA/QC	336	work days	$2,100	$705,600	
	Site Water Management	8,000,000	gal	$0.10	$800,000	
1 Month	General Site Grading	62,000	cy	$12	$744,000	2 Feet over the Half of the Site (No Berm Stabilization Work)
	Surface Water Management System	1	LS	$100,000	$100,000	
2 Months	Import Soil	128,000	cy	$20	$2,560,000	Lagoon Backfill + 4 Foot Layer of Soils Over All Lagoons + Imported Soils to Make Up From General Grading Wastes Shipped Offsite for Disposal + Pit F
	Seeding	19	Acre	$2,000	$38,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$134,000	$134,000	
	Survey	1	LS	$50,000	$50,000	
	Subtotal				**$12,541,000**	
	Subtotal All Construction				**$25,989,000**	
	Contingency @ 5% of Total Cost	**1**	**LS**	**$1,299,000**	**$1,299,000**	
	Total Capital Cost				**$27,288,000**	
	O&M				**$9,922,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$37,210,000**	

[(1)] For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable), and transportation and offsite disposable (as applicable)

Table R-2
Costs for Alternative 2 - Limited Waste Removal
(Conservative)
Ascon Landfill Site

Alternative 2 Conservative Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy

2 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy

Material Processing

1 Pump All Lagoon Liquids (1, 2, and 3) and Dispose as a Liquid Waste for Fuel Blending
2 Unit Rate for Tarry Liquids Disposal Includes Cost for Chemicals Required to Make Oily Wastes Pumpable; Application of Chemicals & Pumping; and Handling and Offsite T&D
3 Assumes a 10% Increase in Tarry Liquid Volume to Account for Chemical Addition to Make Waste Pumpable
4 Emissions Generated While Liquifying the Lagoon Tarry Liquids are Assumed to be Controlled by the Chemical Additive Used to Make these Wastes Pumpable
5 Stabilize All Lagoons (After Removing Tarry Liquids and Before Infilling) by Using a Cement Based Admixture and a Hydraulic Mixing Head Suspended from a Large Crane
6 Special Requirements for Vapor Control While Mixing in the Cement Admixtures into the Lagoon Surface Materials
7 No Geotech Materials Used in Stabilization of Lagoon Surfaces
8 Import Clean Soils to backfill Lagoons, Cover the Lagoon Areas with 4 Feet of Clean Soil, Backfill Pit F to Grade, and Replace VOC Contaminated Soil Removed Offsite During Site Grading Activities
9 General Grading Encounters 10% of the Materials Disturbed as Exceeding Rule 1166 and the Waste Materials are Disposed Offsite as Cal Haz/Non Haz
10 100' x 100' sprung structure required for Pit F excavation; construction time is for erection and dismantling of structure

Scope

1 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
2 Asssumes that Remaining Pit Materials Can Be Left Onsite
3 Assumes Final Agreement will Include Landuse Restrictions, Fencing and Restricted Entry
4 Assumes Recreational or Park Landuse Following Remedy Completion
5 OM&M Costs Consist of 30 Years of Post-Closure Site Maintenance, Monitoring/Reporting, and Project Oversight Costs
6 This Estimate Does Not Include Costs Associated with the Remedial Activities Required for the Western Leased Properties (SCOC)
7 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)

Table R-3
Costs for Alternative No 2- Limited Waste Removal
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost[(1)]	Total Cost	Assumptions
	Assumed Production Rates					
	Liquid Pumping/Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (Days)	**Remove Lagoon 1, 2, and 3 Tars & Pit F and Dispose Offsite**	**Mix with Soil and Excavate**				**Comments**
11	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	14,000	cy	$71	$994,000	Excavate, Mix 50% with Minimally Impacted Soil, and Dispose Offsite. Increase Unit Price by 15% due to bulking of mix soil.
14	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	17,000	cy	$71	$1,207,000	Same as for Lagoon 1 and 3 - Tarry Liquids
6	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	7,000	cy	$71	$497,000	Same as for Lagoons 1 and 2 Tarry Liquids
	Emission Control During Mixing and Excavation	31	days	$1,175	$36,000	Assumes 2 Man Crew with a Foam Spray
66	Pit F Area - Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose of All Pit F Materials
	Emission Control During Excavation	65	days	$2,350	$153,000	Assumes 2 - Two Man Crews with a Foam Spray
96	**Sub-Total**	**79,000**	cy		**$5,839,000**	
	Use Geotextiles for Stabilization	**Stabilize Lagoons 1-3 Before Infilling**				**Comments**
	Emission Control During Soil Placement Activities	22	days	$1,175	$26,000	Assumes 2 Man Crew with a Foam Spray
	Filter Geotextile Layer	435,600	sq ft	$0.15	$65,000	Over Lagoons Only
22	Geo-Grid	435,600	sq ft	$1.00	$436,000	Over Lagoons Only
22	**Sub-Total**				**$527,000**	
118	**Construction Totals**	**79,000**	**cy**		**$6,366,000**	

Table R-3
Costs for Alternative No 2- Limited Waste Removal
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost[(1)]	Total Cost	Assumptions
Additional Construction Time	**General Activities**	**Purchase Property and Manage Construction Activities**				**Comments**
9 Months	Project Services	10.0	months	$113,000	$1,130,000	Add 10% for Rain Days
	Design Permitting @ 15% of Construction Cost	1	LS	$955,000	$955,000	Final Design for Removal Actions
	Mobilization @ 5% of Construction Costs	1	LS	$318,000	$318,000	
	Clearing and Grubbing	19	Acre	$2,200	$42,000	Clear Top Surface of Site Only, Not Slopes
	Health and Safety	210	work days	$1,400	$294,000	
	Air Monitoring	210	work days	$1,900	$399,000	
	QA/QC	210	work days	$2,100	$441,000	
	Site Water Management	5,000,000	gal	$0.10	$500,000	
2 Months	General Site Grading + Lagoon Infilling	87,000	cy	$12	$1,044,000	2 Feet over the Half of the Site+ Lagoon Backfilling (25,461 cy)
	Surface Water Management System	1	LS	$100,000	$100,000	
2 Months	Backfill and Grade Using Imported Soils	93,000	cy	$20	$1,860,000	Assume Imported Soils Are Required to Cover Pit F Area + 4 Foot Layer of Soils Over All Lagoons
	Seeding	19	Acre	$2,000	$38,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$63,600	$64,000	
	Survey	1	LS	$50,000	$50,000	
	Sub-Total				**$7,347,000**	
	Subtotal All Construction				**$13,713,000**	
	Contingency @ 5% of Total Cost	**1**	**LS**	**$686,000**	**$686,000**	
	Total Capital Cost				**$14,399,000**	
	O&M				**$9,922,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$24,321,000**	

[(1)] For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-3
Costs for Alternative No 2- Limited Waste Removal
(Best Case)
Ascon Landfill Site

Alternative 2 Best Case Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy

Waste Processing

1 Mix All Lagoon Liquids (1, 2, and 3) with 50% Volume Increase for Onsite Soils and Dispose as Solid Waste
2 Stabilize All Lagoons Before Covering by Using Onsite Materials and Geotextile Grids and Fabrics
3 Use Spray or Mists for Vapor Control While Mixing in the Site Soils into the Lagoon Surface Materials; Foams Should Not Affect Disposal Options or Cost
4 No Cement or Chemical Admixtures Used in Mixing Site Soils Into the Surface of the Lagoons
5 Use Imported Soils to Cover the Lagoon Areas and Pit F, Minimally Impacted Site Soils (From Grading) for Backfilling Lagoons
6 Rule 1166 Wastes Encountered During Final Grading Can Be Reused Onsite

Scope/General

1 Assumes Pit F Materials are Contained within the Current Site Boundaries
2 Asssumes that Remaining Pit Materials Can Be Left Onsite
3 Assumes Final Agreement will Include Land use Restrictions, Fencing and Restricted Entry
4 Assumes Recreational or Park Landuse Following Remedy Completion
5 O&M Costs Include 30 Years of Post Closure Site Maintenance, Monitoring/Reporting, and Project Oversight Costs
6 This Estimate Does Not Include Costs Associated with the Remedial Activities Required for the Western Leased Properties (SCOC)
7 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)

Table R-4
Costs for Alternative 3 Protective (Monolithic) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (days)	**Remove Lagoon 1, 2, and 3 Tars & Incinerate by Fuel Blending, Remove Pit F, and Dispose Offsite (Sprung Structure Required)**					**Comments**
16	Lagoon 1 - Tarry Liquids - Non Haz Disposal	2,062,000	gal.	$1.25	$2,578,000	Pump Lagoon Tarry Liquids and Incinerate by Fuel Blending (10% Volume Increase)
20	Lagoon 2 - Tarry Liquids - Non Haz Disposal	2,546,000	gal.	$1.25	$3,183,000	Same as above
8	Lagoon 3 - Tarry Liquids - Non Haz Disposal	1,048,000	gal.	$1.25	$1,310,000	Same as above
66	Pit F Area - Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose Offsite
15	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
125	**Subtotal**	**69,000**	**cy**		**$10,273,000**	
	Remove North and East Berms Off City Parcel and for Cap Setback; Stabilize Lagoons 1 to 5 with Cement; Crush Near Surface Concrete and Reuse					**Comments**
130	Stabilize Lagoons 1 to 5 Before Infilling/Installing Cap	81,000	cy	$35	$2,835,000	Use Cement Admixture to Stabilize 5 Feet Deep Over 10 Acres
	Protective Shoring	60,000	sf	$80	$4,800,000	1,500 lf shoring along Hamilton and northeast corner of Site
1	Lagoon 4 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
1	Lagoon 5 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
16	Remove Berms - Impacted Soil - Cal Haz Disposal	20,000	cy	$81	$1,620,000	
18	Remove Berms - Drilling Mud - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Assume material can be mixed with impacted soil excavated concurrently from berms (5.5K required at 25% mix).
0	Sprung Structure for Excavating Lagoon 4 and 5 Drilling Muds	0	sq ft	$50	$0	Not Required
	Concrete Construction Debris	23,000	cy	$30	$690,000	Crush Surface Concrete and Reuse Onsite
165	**Subtotal**	**44,000**	**cy**		**$11,659,000**	Increased Time Frame to Allow for Stabilization of Lagoons 1 to 5
	Monolithic Soil Cap	**38 Acre Cap Over Entire Site**				
10	**Rule 1166 Wastes Generated During Site Grading**	**10%**	**123,000**	**$77**	**$941,000**	Assumes a Percentage of Materials Disturbed by Grading Requires Offsite Disposal (50% as Cal Haz, 50% as Non Haz)
300	**Total Construction**	**125,000**	**cy**		**$22,873,000**	

Table R-4
Costs for Alternative 3 Protective (Monolithic) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
Additional Construction Time	**General Activities**	**Engineering Design, Permitting, Oversight + Imported Materials & Grading Onsite Materials**				
22 Months	Project Services	25	months	$113,000	$2,825,000	Add 10% for Rain Days
	Design Permitting @ 15% of Construction Costs	1	LS	$1,541,000	$1,541,000	
	Mobilization @ 5% of Construction Costs	1	LS	$514,000	$514,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	525	work days	$1,400	$735,000	
	Air Monitoring	525	work days	$1,900	$997,500	
	QA/QC	525	work days	$2,100	$1,102,500	
	Site Water Management	12,500,000	gal	$0.10	$1,250,000	
2 Months	Site Grading	123,000	cy	$12	$1,476,000	Assumes 90% of the 2 Feet of Grading Over Entire Site are Below 50 ppm VOCs (or Can Be Encapsulated per Rule 1166) and Can be Excavated and Relocated Onsite
	Surface Water Management System	1	LS	$100,000	$100,000	
6 Months	Import Soil	297,000	cy	$20	$5,940,000	Pit F + 4 feet over 38 acres + Lagoon Backfill; Volume Required Less Reusable Crushed Concrete
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$102,800	$103,000	
	Survey	1	LS	$75,000	$75,000	
	Subtotal General Activities				**$16,906,000**	
	Install 1.75 acre soil cap over South Coast Oil Corp. Leased Area	**1**	**LS**	**$965,000**	**$965,000**	4 foot soil cover, grade top 2 feet to drain
	Subtotal ALL				**$40,744,000**	
	Contingency	**1**	**LS**	**$2,037,000**	**$2,037,000**	
	Total Capital Cost				**$42,781,000**	
	O&M				**$11,214,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$53,995,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-4
Costs for Alternative 3 Protective (Monolithic) Cap
(Conservative)
Ascon Landfill Site

Alternative 3 Conservative Assumptions

Waste Classification

1 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy
2 Lagoon 4 + 5 Drilling Muds - Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils - All Cal Haz - due to leachable lead and Non Haz; TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy

Waste Processing

1 Pump All Lagoon Tarry Liquids (1, 2 and 3) and Dispose as a Liquid Waste by Fuel Blending
2 Unit Rate for Tarry Liquids Disposal Includes Chemicals Required to Make Oily Wastes Pumpable, Application & Pumping, Handling and Offsite T&D
3 Assumes a 10% Increase in Liquid Volume to Account for Chemical Addition to Make Waste Pumpable
4 Emissions Generated While Liquifying the Lagoon Tars are Assumed to be Controlled by the Chemical Additive Used to Make these Wastes Pumpable
5 Stabilize Lagoons 1 to 5 (10 Acres) by Using a Cement Based Admixture and a Hydraulic Mixing Head Suspended from a Large Crane
6 Special Requirements for Vapor Control While Mixing in the Cement Admixtures into the Lagoon Surface Materials
7 Import Clean Soils to Cover Entire Site with 4 Feet of Soil, Backfill Pit F and Infill Lagoons 1, 2 and 3
8 Assumes General Grading Encounters 10% of the Materials Disturbed as Exceeding Rule 1166 and the Waste Materials are Disposed Offsite as Non Hazardous and California Hazardous
9 100' x 100' Sprung Structure Required for Pit F Excavation; Construction Time is For Erection and Dismantling of Structure
10 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Parcel and Drilling Muds in Lagoons 4 and 5 to Extent Needed to Build Cap
2 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
3 Asssumes that Remaining Pit Materials Can Be Left Onsite
4 OM&M Costs Consist of 30 Years of Post-Closure Site Maintenance, Monitoring/Reporting, and Project Oversight Costs
6 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
7 Install shoring in northern portions of Lagoons 4 and 5 to facilitate removal of north berm materials in City parcel
8 Install 1.75 acre soil cap over South Coast Oil Corporation leased property

Table R-5
Costs for Alternative 3 - Protective (Monolithic) Cap
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (Days)	**Excavate Lagoon Tars and Pit F**					
11	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	14,000	cy	$70	$982,000	Excavate, Mix with 50% Minimally Impacted Soil, and Dispose Offsite (Cal-Haz). Increase Unit Price by 15% due to bulking of mix soil.
14	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	17,000	cy	$70	$1,193,000	Same as for Lagoon 1 and 3 Tarry Liquids
6	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	7,000	cy	$70	$491,000	Same as for Lagoons 1 and 2 Tarry Liquids
	Emission Control During Mixing and Excavation	31	days	$1,175	$36,000	Assumes 2 Man Crew with a Foam Spray
66	Pit F Area - Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose Offsite
	Vapor Control for Pit F Excavation	65	day	$2,350	$153,000	Provide 2-Two Man Crews Plus Pump and Chemicals
96	**Subtotal**	**79,000**	**cy**		**$5,807,000**	
	Remove North and East Berms Off City Parcel and for Cap Setback; Stabilize Lagoons 1 to 5 with Cement; Crush Near Surface Concrete and Reuse					
50	Geotextile Materials	435,600	sq ft	$0.15	$65,000	Cover Lagoons 1 to 5
	GeoGrid	435,600	sq ft	$1.00	$436,000	Cover Lagoons 1 to 5
	Protective Shoring	60,000	sf	$80	$4,800,000	1,500 lf shoring along Hamilton and northeast corner of Site
1	Lagoon 4 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
1	Lagoon 5 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
16	Remove Berms - Impacted Soil - Cal Haz Disposal	20,000	cy	$81	$1,620,000	
18	Remove Berms - Drilling Mud - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Assume can be mixed with impacted soil excavated concurrently from berms (5.5K required at 25% mix).
	Concrete Construction Debris	23,000	cy	$30	$690,000	Crush Surface Concrete and Reuse Onsite
	Vapor Control for Lagoon Muds Excavation and Mixing	2	days	$1,175	$2,000	Provide 2 Man Crew Plus Pump and Chemicals
86	**Subtotal**	**44,000**	**cy**		**$4,527,000**	**Increased Time Frame to Allow for Stabilization of Lagoons 1 to 5**
	Monolithic Soil Cap	**38 Acre Cap Over Entire Site**				
0	**Rule 1166 Wastes Generated During Site Grading**	**0%**	**0**	**$0**	**$0**	**Not Applicable**
182	**Total Construction**	**123,000**	**cy**		**$10,334,000**	

Table R-5
Costs for Alternative 3 - Protective (Monolithic) Cap
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
Additional Construction Time	**General Activities**	**Engineering Design, Permitting, Oversight + Imported Materials & Grading Onsite Materials**				
17 Months	Project Services	19	months	$113,000	$2,147,000	Add 10% for Rain Days
	Design Permitting @ 15% of Construction Costs	1	LS	$871,000	$871,000	
	Mobilization @ 5% of Construction Costs	1	LS	$290,000	$290,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	399	work days	$1,400	$559,000	
	Air Monitoring	399	work days	$1,900	$758,000	
	QA/QC	399	work days	$2,100	$837,900	
	Site Water Management	9,500,000	gal	$0.10	$950,000	
3 Months	Site Grading + Lagoon Infill	148,000	cy	$12	$1,776,000	Assumes All of the 2 Feet of Grading Over Entire Site are Acceptable Under Rule 1166 (Encapsulation)
	Surface Water Management System	1	LS	$100,000	$100,000	
6 Months	4 Foot Cover Over 38 Acres + Backfill Pit F	292,000	cy	$20	$5,840,000	4 feet over 38 acres + Pit F; Volume Required Less Reusable Crushed Concrete
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$58,000	$58,000	
	Survey	1	LS	$75,000	$75,000	
	Subtotal General Activities				**$14,509,000**	
	Install 1.75 acre soil cap over South Coast Oil Corp. Leased Area	**1**	**LS**	**$965,000**	**$965,000**	4 foot soil cover, grade top 2 feet to drain
	Subtotal ALL				**$25,808,000**	
	Contingency	**1**	**LS**	**$1,290,000**	**$1,290,000**	
	Total Capital Cost				**$27,098,000**	
	O&M				**$11,214,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$38,312,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-5
Costs for Alternative 3 - Protective (Monolithic) Cap
(Best Case)
Ascon Landfill Site

Alternative 3 Best Case Assumptions

Waste Classification

1 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy
2 Lagoon 4 + 5 Drilling Muds - Cal-Haz/Non-Haz @ 50% - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils - All Cal Haz - due to leachable lead and Non Haz; TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy

Waste Processing

1 Mix All Lagoon Liquids (1, 2 and 3) with 50% Volume Increase for Onsite Soils and Dispose as Solid Waste
2 Stabilize All Lagoons Before Covering by Using Onsite Materials and Geotextile Grids and Fabrics
3 Import Clean Soils to Cover Entire Site with 4 Feet of Soil and Backfill Pit F
4 Waste Materials Encountered During Grading that Exceed Rule 1166 Limits Can Be Placed Under Site Cap
5 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Parcel and Drilling Muds in Lagoons 4 and 5 to Extent Needed to Build Cap
2 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
3 Asssumes that Remaining Pit Materials Can Be Left Onsite
4 Assumes Final Agreement will Include Land Use Limitations for the Site
5 OM&M Costs Consist of 30 Years of Post Closure Site Maintenance, Monitoring/Reporting, and Project Oversight
6 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
7 Install shoring in northern portions of Lagoons 4 and 5 to facilitate removal of north berm materials in City parcel
8 Install 1.75 soil cap over South Coast Oil Corporation leased property

Table R-6
Costs for Alternative No. 3 - Protective (Multilayer) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (Days)	**Lagoon Tars and Pit F Removed**					
16	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	2,062,000	gal.	$1.25	$2,578,000	Pump Lagoon Tarry Liquids and Incinerate by Fuel Blending (10% Volume Increase)
20	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	2,546,000	gal.	$1.25	$3,183,000	Same as above
8	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	1,048,000	gal.	$1.25	$1,310,000	Same as above
66	Pit F Area -Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose Offsite
15	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
125	**Subtotal**	**69,000**	**cy**		**$10,273,000**	
	Remove North and East Berms Off City Parcel and for Cap Setback; Stabilize Lagoons 1 to 5 with Cement; Crush Near Surface Concrete and Reuse					
130	Stabilize Lagoon 1 to 5 Before Infilling	81,000	cy	$35	$2,835,000	Use Cement Admixture to Stabilize 5 Feet Deep Over 10 Acres
	Protective Shoring	60,000	sf	$80	$4,800,000	1,500 lf shoring along Hamilton and northeast corner of Site
1	Lagoon 4 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
1	Lagoon 5 - Drilling Muds - Cal Haz Disposal - Mix 25% with Impacted Soil	1,000	cy	$76	$76,000	
16	Remove Berms - Impacted Soil - Cal Haz Disposal	20,000	cy	$81	$1,620,000	
18	Remove Berms - Drilling Mud - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Assume material can be mixed with impacted soils excavated concurrently from berm (5.5K required at 25% mix ratio).
0	Sprung Structure for Excavating Lagoon 4 and 5 Drilling Muds	0	sq ft	$50	$0	Not Required
	Concrete Construction Debris	23,000	cy	$30	$690,000	Crush Surface Concrete and Reuse Onsite
165	**Subtotal**	**44,000**	**cy**		**$11,659,000**	Increased Time Frame to Allow for Stabilization of Lagoons 1 to 5
	MultilayerCap				**38 Acre Cap Over Entire Site**	
20	Geomembrane Materials	1,655,000	sq ft	$0.70	$1,159,000	60 mil HDPE Liner
	Geosynthetic Clay Liner	1,655,000	sq ft	$0.70	$1,159,000	
	Drainage Layer	1,655,000	sq ft	$0.65	$1,076,000	using geocomposite drainage layer
	Biotic Layer - Use Geonet	1,655,000	sq ft	$0.45	$745,000	
126	Earthwork - Pipe Trench Excavation, Backfill, Compaction	650	cy	$210	$137,000	
	Install Gas Collection System Piping (including geonet)	1	ls	$2,000,000	$2,000,000	6" HDPE headers and laterals & connect to blower
	Install Gas/Condensate Control System	1	ls	$250,000	$250,000	Install concrete pad, blower skid and enclosure, and electrical supply
	Vapor Treatment System	1	LS	$250,000	$250,000	Supply and install thermal oxidizer
146	**Subtotal**				**$6,776,000**	
10	**Rule 1166 Wastes Generated During Site Grading**	**10%**	**123,000**	**$77**	**$941,000**	Assumes a Percentage of Materials Disturbed by Grading Requires Offsite Disposal (50% as Cal Haz, 50% as Non Haz)
446	**Total Construction**	**125,000**	**cy**		**$29,649,000**	

Table R-6
Costs for Alternative No. 3 - Protective (Multilayer) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
Additional Construction Time	**General Activities**	**Engineering Design, Permitting, Oversight + Imported Materials & Grading Onsite Materials**				
27 Months	Project Services	30	months	$113,000	$3,390,000	Add 10% for Rain Days
	Design Permitting @ 15% of Construction Costs	1	LS	$2,557,350	$2,557,000	
	Mobilization @ 5% of Construction Costs	1	LS	$852,450	$852,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	630	work days	$1,400	$882,000	
	Air Monitoring	630	work days	$1,900	$1,197,000	
	QA/QC	630	work days	$2,100	$1,323,000	
	Site Water Management	15,000,000	gal	$0.10	$1,500,000	
2 Months	Site Grading	123,000	cy	$12	$1,476,000	Assumes Half of the 2 Feet of Grading Over Entire Site are Acceptable Under Rule 1166 (Encapsulation) and Balance Must be Disposed Offsite
	Surface Water Management System	1	LS	$100,000	$100,000	
4 Months	3 Foot Cover Over 38 Acres + Backfill Pit F + Lagoon Infill	229,000	cy	$20	$4,580,000	Pit F + 3 feet over 38 acres + Lagoon Infill
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$170,490	$170,000	
	Survey	1	LS	$75,000	$75,000	
	Subtotal General Activities				**$18,349,000**	
	Install 1.75 acre multilayer cap over South Coast Oil Corp. leased property	**1**	**LS**	**$1,150,000**	**$1,150,000**	Install 3 foot soil cover, geomembrane/GCL and gas collection and control system
	Subtotal ALL				**$49,148,000**	
	Contingency	**1**	**LS**	**$2,457,000**	**$2,457,000**	Due to the FS Level of Accuracy for Cost Estimates (- 50% and + 25%) Only 5% was Used for this Estimate
	Capital Cost				**$51,605,000**	
	O&M				**$20,553,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$72,158,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-6
Costs for Alternative No. 3 - Protective (Multilayer) Cap
(Conservative)
Ascon Landfill Site

Alternative 3 Conservative Assumptions

Waste Classification

1 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy
2 Lagoon 4 + 5 Drilling Muds - Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils - All Cal Haz - due to leachable lead and Non Haz; TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy

Waste Processing

1 Pump All Lagoon Tarry Liquids (1, 2 and 3) and Dispose as a Liquid Waste by Fuel Blending
2 Unit Rate for Tarry Liquids Disposal Includes Chemicals Required to Make Oily Wastes Pumpable, Application & Pumping, Handling and Offsite T&D
3 Assumes a 10% Increase in Liquid Volume to Account for Chemical Addition to Make Waste Pumpable
4 Emissions Generated While Liquifying the Lagoon Tars are Assumed to be Controlled by the Chemical Additive Used to Make these Wastes Pumpable
5 Stabilize Lagoons 1 to 5 (10 Acres) by Using a Cement Based Admixture and a Hydraulic Mixing Head Suspended from a Large Crane
6 Special Requirements for Vapor Control While Mixing in the Cement Admixtures into the Lagoon Surface Materials
7 Import Clean Soils to Cover Entire Site with 3 Feet of Soil, Backfill Pit F and Infill the Lagoon 1, 2 and 3
8 Assumes General Grading Encounters 10% of the Materials Disturbed as Exceeding Rule 1166 and the Waste Materials are Disposed Offsite as Non Hazardous and California Hazardous
9 100' x 100' sprung structure required for Pit F excavation; construction time is for erection and dismantling of structure
10 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Property and Drilling Muds in Lagoons 4 and 5 to Extent Needed to Build Cap
2 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
3 Asssumes that Remaining Pit Materials Can Be Left OnSite
4 OM&M Costs Consist of 30 Years of Post-Closure Site Maintenance, Monitoring/Reporting, and Project Oversight Costs
5 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
6 Install shoring in northern portions of Lagoons 4 and 5 to facilitate removal of north berm materials in City parcel
7 Install gas collection and control system (GCCS) with thermal oxidizer treatment system
8 Install 1.75 acre multilayer cap over South Coast Oil Corporation leased property

Table R-7
Costs for Alternative 3 - Protective (Multilayer) Cap
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (Days)	**Excavate Lagoon Tars and Pit F**					
11	Lagoon 1 - Tarry Liquids	14,000	cy	$70	$982,000	Excavate, Mix with 50% Minimally Impacted Soil, and Dispose Off Site (Non-Haz). Increase Unit Price by 15% due to bulking of mix soil.
14	Lagoon 2 - Tarry Liquids	17,000	cy	$70	$1,193,000	Same as for Lagoon 1 and 3 Tarry Liquids
6	Lagoon 3 - Tarry Liquids	7,000	cy	$70	$491,000	Same as for Lagoons 1 and 2 Tarry Liquids
	Emission Control During Mixing and Excavation	31	days	$1,175	$36,000	Assumes 2 Man Crew with a Foam Spray
66	Pit F Area - Impacted Soils	41,000	cy	$72	$2,952,000	Excavate and Dispose Offsite
	Vapor Control for Pit F Excavation	65	day	$2,350	$153,000	Provide 2- Two Man Crews Plus Pump and Chemicals
96	**Subtotal**	**79,000**	**cy**		**$5,807,000**	
	Remove North and East Berms Off City Parcel and for Cap Setback; Stabilize Lagoons 1 to 5 with Cement; Crush Near Surface Concrete and Reuse					
50	Geotextile Materials	435,600	sq ft	$0.15	$65,000	Cover Lagoons 1 to 5
	GeoGrid	435,600	sq ft	$1	$436,000	Cover Lagoons 1 to 5
	Protective Shoring	60,000	sf	$80	$4,800,000	1,500 lf shoring along Hamilton and northeast corner of Site
1	Lagoon 4 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
1	Lagoon 5 - Drilling Muds - Cal Haz Disposal (Mix 25% with Impacted Soil)	1,000	cy	$76	$76,000	
16	Remove Berms - Impacted Soil - Cal Haz Disposal	20,000	cy	$81	$1,620,000	
18	Remove Berms - Drilling Mud - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Assume can be mixed with impacted soils excavated concurrently from berm (5.5 K required at 25% mix ratio).
	Concrete Construction Debris	23,000	cy	$30	$690,000	Crush Surface Concrete and Reuse Onsite
	Vapor Control for Lagoon Stabilization & Removal	2	days	$1,175	$2,000	Provide 2 Man Crew Plus Pump and Chemicals
86	**Subtotal**	**44,000**	**cy**		**$9,327,000**	Increased Time Frame to Allow for Stabilization of Lagoons 1, 2, and 3
	Multilayer Cap				**38 Acre Cap Over Entire Site**	
20	Geomembrane Materials	1,655,280	sq ft	$0.70	$1,159,000	60 mil HDPE Liner
	Geosynthetic Clay Liner	1,655,280	sq ft	$0.70	$1,159,000	
	Drainage Layer	1,655,280	sq ft	$0.65	$1,076,000	using geocomposite drainage layer
	Biotic Layer - Use Geonet	1,655,280	sq ft	$0.45	$745,000	
126	Earthwork - Pipe Trench Excavation, Backfill, Compaction	650	cy	$169	$110,000	
	Install Gas Collection System Piping (including geonet)	1	ls	$1,800,000	$1,800,000	
	Install Gas/Condensate Control System	1	ls	$225,000	$225,000	

Table R-7
Costs for Alternative 3 - Protective (Multilayer) Cap
(Best Case)
Ascon Landfill Site

	Vapor Treatment System	1	LS	$100,000	$100,000	Install Granular Activated Carbon System
146	**Subtotal**				**$6,374,000**	
0	**Rule 1166 Wastes Generated During Site Grading**	**0%**	**0**	**$0**	**$0**	
328	**Total Construction**	**123,000**	**cy**		**$21,508,000**	
Projected Time Frame	**Project Area**	**Quantity**	**Units**	**Unit Cost(1)**	**Total Cost**	**Assumptions**
Construction Time	**General Activities**	**Engineering Design, Permitting, Oversight + Imported Materials & Grading Onsite Materials**				
22 Months	Project Services	25	months	$113,000	$2,825,000	Add 10% for Rain Days
	Design Permitting @ 15% of Construction Costs	1	LS	$1,827,150	$1,827,150	
	Mobilization @ 5% of Construction Costs	1	LS	$609,050	$609,050	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	525	work days	$1,400	$735,000	
	Air Monitoring	525	work days	$1,900	$998,000	
	QA/QC	525	work days	$2,100	$1,103,000	
	Site Water Management	12,500,000	gal	$0.10	$1,250,000	
3 Months	Site Grading + Lagoon Infill	148,000	cy	$12	$1,776,000	Assumes 2 Feet of Grading Over Entire Site are Acceptable Under Rule 1166 (Encapsulation)
	Surface Water Management System	1	LS	$100,000	$100,000	
4 Months	3 Foot Cover Over 38 Acres + Backfill Pit F	225,000	cy	$20	$4,500,000	Pit F + 3 feet over 38 acres
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$121,810	$121,810	
	Survey	1	LS	$75,000	$75,000	
	Subtotal General Activities				**$16,167,000**	
	Install 1.75 acre multilayer cap over South Coast Oil Corp. leased property	**1**	**LS**	**$1,150,000**	**$1,150,000**	Install 3 foot soil cover, geomembrane/GCL and gas collection and control system
	Subtotal ALL				**$38,825,000**	
	Contingency	**1**	**LS**	**$1,941,000**	**$1,941,000**	
	Capital Cost				**$40,766,000**	
	O&M				**$20,553,000**	
	Total Capital Cost				**$61,319,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offiste disposable (as applicable)

Table R-7
Costs for Alternative 3 - Protective (Multilayer) Cap
(Best Case)
Ascon Landfill Site

Alternative 3 Best Case Assumptions

Waste Classification

1 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy
2 Lagoon 4 + 5 Drilling Muds - Cal-Haz/Non-Haz @ 50% - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils - All Cal Haz - due to leachable lead; TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy

Waste Processing

1 Mix All Lagoon Liquids (1, 2 and 3) with 50% Volume Increase for Onsite Soils and Dispose as Solid Waste
2 Stabilize All Lagoons Before Covering by Using Onsite Materials and Geotextile Grids and Fabrics
3 Import Clean Soils to Cover Entire Site with 4 Feet of Soil and Backfill Pit F
4 Waste Materials Encountered During Grading that Exceed Rule 1166 Limits Can Be Placed Under Site Cap
5 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Parcel and Drilling Muds in Lagoons 4 and 5 to Extent Needed to Build Cap
2 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
3 Stabilize Berm Around the Entire Site (1400 ft by 4 sides by 45 cy/ft.)
4 Assumes Final Agreement will Include Land Use Limitations for the Site
5 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
6 OM&M Costs Consist of 30 Years of Post Closure Site Maintenance, Monitoring/Reporting, and Project Oversight
7 Install 1.75 acre multilayer cap over South Coast Oil Corporation leased property
8 Install shoring in northern portions of Lagoons 4 and 5 to facilitate removal of north berm materials in City parcel
9 Install gas collection and control system (GCCS) with Granular activated carbon (GAC) treatment

Table R-8
Costs for Alternative No. 4 - Partial Source Removal with Protective (Monolithic) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (Days)	**Pump Lagoon Tars and Excavate Pits A - H & Dispose Offsite**					
16	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	2,062,000	gal	$1.25	$2,578,000	Pump Lagoon Tarry Liquids and Incinerate by Fuel Blending (10% Volume Increase)
20	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	2,546,000	gal	$1.25	$3,183,000	Same as above
8	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	1,048,000	gal	$1.25	$1,310,000	Same as above
	Emission Control During Mixing and Excavation (Lagoons 1-3)	44	days	$1,175	$52,000	Assumes 1 Two Man Crew with a Foam Spray
6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Remove and Dispose Offsite
3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	Emission Control During Mixing and Excavation - Non-Pit F Pits	12	days	$1,175	$14,000	Assumes 1 Two Man Crew with a Foam Spray
66	Pit F Area - Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Remove and Dispose Offsite
15	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
138	**Subtotal**	**85,000**			**$11,491,000**	
	Remove All Waste/Impacted Materials in City Parcel along Hamilton and Magnolia and Drilling Mud in Lagoons 4 and 5 down to Street Elevation					
64	Stabilize Lagoon 1 to 3 Before Covering	40,000	cy	$35	$1,400,000	Use Cement Admixture to Stabilize 5 Feet Deep Over 5 Acres (Lagoons 4 and 5, if removed to street level, will have approx. 1 ft of drilling mud remaining)
	Vapor Control for Lagoon Stabilization	65	days	$1,175	$76,000	Provide 2 Man Crew Plus Pump and Chemicals
26	Lagoon 4 - Drilling Muds - Cal Haz disposal	33,000	cy	$66	$2,178,000	Remove to Street Level, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
12	Lagoon 5 - Drilling Muds - Cal Haz disposal	15,000	cy	$66	$990,000	Remove to Street Level, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
165	Sprung Structure for Excavating Lagoon 4 and 5 Drilling Muds	109,000	sq ft	$50	$5,450,000	Sprung Structure is 2.5 acre (size of Lagoon 4/5)
16	Impacted Fill Soils - non-pit - Cal Haz Disposal	20,000	cy	$81	$1,620,000	Assumes Offsite Disposal as Cal Haz
18	Highly Liquid Drilling Muds - non-pit - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
0	Drilling Muds - unsaturated - Cal Haz Disposal	0	cy	$71	$0	Insufficient Data to Assume Part is Non Hazardous
0	Minimally Impacted Soils - Mix with Highly Liquid Drilling Muds and Dispose Offsite	0	cy	$81	$0	17,500 cy required for mixing at 25% with drilling muds in berms and Lagoons 4 and 5 can be satisfied with soil excavated from berms.
0	Minimally Impacted Soils - Use for Cap Foundation, Backfilling	0	cy	$12	$0	
18	Crush Concrete Construction Debris & Use Onsite	23,000	cy	$30	$690,000	Crush and use under cap or during backfilling
0	Impacted Native Clay - Cal Haz Disposal	0	cy	$81	$0	
319	**Subtotal**	**90,000**	**cy**		**$13,966,000**	
49	**Rule 1166 Wastes Generated During Site Grading**	**10%**	**123,000**	**$77**	**$941,000**	Assumes a Percentage of Materials Disturbed by Grading Requires Offsite Disposal (50% as Cal Haz, 50% as Non Haz)
458	**Total Waste Removal**	**187,000**	**cy**		**$26,398,000**	

Table R-8
Costs for Alternative No. 4 - Partial Source Removal with Protective (Monolithic) Cap
(Conservative)
Ascon Landfill Site

	Total Construction	**187,000**	**cy**		**$26,398,000**	
Additional Construction	**General Activities**	**Design/ Permitting/ Construction Management/ Backfilling & Grading**				
	Purchase Easement	1.65	Acre	$0.00	$0	
34 Months	Project Services	38	months	$113,000	$4,294,000	Increased 10% for Rain Days
	Design Permitting @ 10% of Construction Costs	1	LS	$2,545,700	$2,546,000	
	Mobilization @ 5% of Construction Costs	1	LS	$1,272,850	$1,273,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	798	work days	$1,400	$1,117,000	
	Air Monitoring	798	work days	$1,900	$1,516,000	
	QA/QC	798	work days	$2,100	$1,676,000	
	Site Water Management	19,000,000	gal	$0.10	$1,900,000	
2 Months	Final Site Grading - Cap Construction	123,000	cy	$12	$1,476,000	2 feet over 38 Acre Cap; Unit Cost Includes Sampling These Materials
	Surface Water Management System	1	LS	$100,000	$100,000	
11 Months	Backfill and Grade - Imported Soils	296,000	cy	$20	$5,920,000	Clean import soil required for cap cover (4' over 38 acres), Lagoons 1-3 and Pit F backfill
	Seeding	38	Acre	$2,000	$76,000	Hydroseed
	Install New Fence Around Entire Site	5,600	LF	$20	$112,000	
	Demobilization	1	LS	$254,570	$255,000	
	Survey	1	LS	$50,000	$50,000	
	Subtotal General Activities				**$22,370,000**	
	Install 1.75 acre soil cap over South Coast Oil Corp. Leased Area	**1**	**LS**	**$965,000**	**$965,000**	4 foot soil cover, grade top 2 feet to drain
	Subtotal All Construction Activities				**$49,733,000**	
	Contingency	**1**	**LS**	**$2,487,000**	**$2,438,000**	
	Total Capital Costs				**$52,171,000**	
	O&M				**$11,214,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$63,385,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-8
Costs for Alternative No. 4 - Partial Source Removal with Protective (Monolithic) Cap
(Conservative)
Ascon Landfill Site

Alternative 4 Conservative Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - All Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils - All Cal Haz - due to leachable lead; TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy

Waste Handling/Processing

1 Pump All Lagoon Liquids (1, 2 and 3) and Dispose as a Liquid Waste by Fuel Blending
2 Unit Rate for Tarry Liquids Disposal Includes Chemicals Required to Make These Wastes Pumpable
3 Volume of Tarry Liquids Assumes a 10% Increase in Liquid Volume to Account for Chemical Addition to Make Waste Pumpable
4 Stabilize Lagoons 1, 2 and 3 (5 Acres) (After Draining, and Before Infilling) by Using a Cement-Based Admixture and a Hydraulic Mixing Head Suspended from a Large Crane
5 Suppressants Are Required During Mixing in the Cement Admixtures into the Lagoon Surface Materials, and Excavation and Mixing of Pit and Lagoon (1-3) Materials
6 Assumes General Grading Encounters 10% of the Materials Disturbed as Exceeding Rule 1166 and the Waste Materials are Disposed Offsite as Non Hazardous and California Hazardous
7 2.5 acre sprung structure is required for Lagoons 4 and 5 to complete excavation of drilling mud; construction time is for erection/dismantling of structure
8 100' x 100' sprung structure required for Pit F excavation; construction time is for erection and dismantling of structure
9 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Parcel and Drilling Muds in Lagoons 4 and 5 to Street Elevation (4 ft AMSL)
2 Install Monolithic Soil Cap over entire Site, including areas where source is removed to street elevation
3 Use Imported Soils to Cover the Entire Site with 3 Feet of Soil Over Cap, Plus Backfilling Pit F and Lagoons 1-3
4 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
5 Assumes that Remaining Pit Materials are Present within the Site Boundaries
6 Assumes Final Agreement will Include Land Use Limitations for the Site
7 O&M Costs Consist of 30 Years of Site Maintenance, Monitoring/Reporting, and Project Oversight
8 Install 1.75 soil cap over South Coast Oil Corporation leased property
9 Assumes that "minimally impacted soils" (that contain lead impacts) can be reused under Site cap
10 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)

Table R-9
Costs for Alternative No. 4 - Partial Source Removal with Protective (Monolithic) Cap
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
	Excavate Lagoon Tars and Pits A - H					
7	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	9,000	cy	$71	$639,000	Mix with 50% Soil (See Below), Excavate and Dispose Offsite as Cal Haz
9	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	11,000	cy	$71	$781,000	Same as above
4	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	5,000	cy	$71	$355,000	Same as above
	Emission Control During Mixing and Excavation	20	days	$1,175	$23,500	Assumes 1 Two Man Crew with a Foam Spray
6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Remove and Dispose Offsite
3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	Emission Control During Mixing and Excavation	13	days	$1,175	$15,275	Assumes 1 Two Man Crew with a Foam Spray
66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Remove and Dispose Offsite
	Emission Control During Mixing and Excavation	65	days	$2,350	$152,750	Assumes 1 Two Man Crew with a Foam Spray
98	**Subtotal**	**82,000**	**cy**		**$6,070,525**	
	Remove All Waste/Impacted Materials in City Parcel along Hamilton and Magnolia and Drilling Mud in Lagoons 4 and 5 down to Street Elevation					
25	Filter Geotextile Layer	217,800	sq ft	$0.15	$32,670	8 oz fabric on both sides of biotic layer and in pipe trenches
	GeoGrid	217,800	sq ft	$1	$217,800	8 oz fabric on both sides of biotic layer and in pipe trenches
26	Lagoon 4 - Drilling Muds - Cal Haz disposal	33,000	cy	$66	$2,178,000	Remove to Street Elevation, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
12	Lagoon 5 - Drilling Muds - Cal Haz disposal	15,000	cy	$66	$990,000	Remove to Street Elevation, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
16	Impacted Fill Soils - Cal Haz Disposal	20,000	cy	$81	$1,620,000	Dispose Offsite as Cal Haz
0	Impacted Fill Soils - non-pit - Reuse Onsite	0	cy	$12	$0	Assume this Material is Placed Under Cap
18	Highly Liquid Drilling Muds - non-pit - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
0	Drilling Muds - unsaturated - Cal Haz Disposal	0	cy	$71	$0	Insufficient Data to Assume Part is Non Hazardous
10	Impacted Fill Soils - Reuse in mixing with lagoon tarry liquids (Cal Haz)	13,000	cy	$81	$1,053,000	Use Cal Haz Impacted Soil
0	Impacted Fill Soils - Reuse in mixing with L4 and L5 drilling muds (Non Haz)	0	cy	$72	$0	Not required - Soils required for mixing with Lagoon 4 and 5 and berm drilling muds (17.5K) from excavation of berms
0	Fill Soils - "Minimal TPH Impact" - Use For Cap Foundation	0	cy	$12	$0	Reuse onsite for cap foundation
18	Crush Concrete Construction Debris & Use Onsite	23,000	cy	$30	$690,000	Use Under Cap for Foundation Material
0	Impacted Native Clay - Cal Haz Disposal	0	cy	$72	$0	Not removing native clay
126	**Subtotal**	**103,000**	**cy**		**$8,343,000**	
0	**Rule 1166 Wastes Generated During Site Grading**	**0%**	**cy**	**$0**	**$0**	**Assumes a Percentage of Materials Disturbed by Grading Requires Offsite Disposal**

Table R-9
Costs for Alternative No. 4 - Partial Source Removal with Protective (Monolithic) Cap
(Best Case)
Ascon Landfill Site

224	**Total Construction**	**185,000**	**cy**		**$14,414,000**	
Projected Time Frame	**Project Area**	**Quantity**	**Units**	**Unit Cost(1)**	**Total Cost**	**Assumptions**
Additional Construction Time	**General Activities**	**Design/ Permitting/ Construction Management/ Backfilling & Grading**				
	Purchase Easement	1.65	Acre	$0.00	$0	
24 Months	Project Services	27	months	$113,000	$3,051,000	Increased 10% for Rain Days
	Design Permitting @ 10% of Construction Costs	1	LS	$1,441,000	$1,441,000	
	Mobilization @ 5% of Construction Costs	1	LS	$720,500	$720,500	
	Clearing and Grubbing	27	Acre	$2,200	$59,400	
	Health and Safety	567	work days	$1,400	$793,800	
	Air Monitoring	567	work days	$1,900	$1,077,300	
	QA/QC	567	work days	$2,100	$1,190,700	
	Site Water Management	13,500,000	gal	$0.10	$1,350,000	
2 Months	Final Site Grading (2 Feet Over 38 Acre Cap + Lagoon Infill)	148,000	cy	$12	$1,776,000	
	Surface Water Management System	1	LS	$100,000	$100,000	
	Reuse of Minimally Impacted Site Soils: Relocation and Backfill/Compaction	23,000	cy	$0	$0	
12 Months	Backfill and Grade - Imported Soils	292,000	cy	$20	$5,840,000	4' over 38 acres, plus Pit F backfill
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$144,100	$144,100	
	Survey	1	LS	$50,000	$50,000	
	Subtotal General Activities				**$17,782,000**	
	Install 1.75 acre soil cap over South Coast Oil Corp. Leased Area	**1**	**LS**	**$965,000**	**$965,000**	4 foot soil cover, grade top 2 feet to drain
	Subtotal All Construction Activities				**$33,161,000**	
	Contingency	**1**	**LS**	**$1,658,000**	**$1,610,000**	
	Total Capital Costs				**$34,771,000**	
	O&M				**$11,214,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$45,985,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-9
Costs for Alternative No. 4 - Partial Source Removal with Protective (Monolithic) Cap
(Best Case)
Ascon Landfill Site

Alternative 4 Best Case Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for offsite disposal as daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - All Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - All Cal Haz - due to leachable lead, TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy

Waste Processing/Handling

1 Mix Lagoon Tarry Liquids (1, 2 and 3) and Highly Liquid Drilling Muds with Impacted Soils and Dispose as a Solid Waste
2 Volumes for Tarry Liquids Disposal Includes Mixed Impacted Soils
3 Assumes a 50% Increase in Tarry Liquids Volume to Account for Mixing with Impacted Soil
4 Stabilize Lagoons 1, 2 and 3 (5 Acres) Before Backfilling Using Site Soils, Geomembrane and Geofabric Materials
5 Use Foam Spray or Mists for Vapor Control While Mixing in the Site Soils into the Lagoon Surface Materials and Excavation of Pits
6 Waste Materials Encountered During Grading that Exceed Rule 1166 Limits Can Be Placed Under Site Cap
7 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Parcel and Drilling Muds in Lagoons 4 and 5 to Street Elevation (4 ft AMSL)
2 Install Monolithic Soil Cap over entire Site, including areas where source is removed to street elevation
3 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
4 Asssumes that Remaining Pit Materials are Present within the Site Boundaries
5 Assumes Final Agreement will Include Land Use Limitations for the Site
6 O&M Costs Consist of 30 Years of Post Closure Site Maintenance, Monitoring/Reporting, and Project Oversight
7 Install 1.75 soil cap over South Coast Oil Corporation leased property
8 Assumes that "minimally impacted" site soils that could include lead impacts can be reused under Site Cap.
9 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)

Table R-10
Costs for Alternative No. 4 - Partial Source Removal with Protective (Multilayer) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Construction Time (Days)	**Pump Lagoon Tars and Excavate Pits A - H & Dispose Offsite**					
16	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	2,062,000	gal	$1.25	$2,578,000	Pump Lagoon Tarry Liquids and Incinerate by Fuel Blending (10% Volume Increase)
20	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	2,546,000	gal	$1.25	$3,183,000	Same as above
8	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	1,048,000	gal	$1.25	$1,310,000	Same as above
	Emission Control During Mixing and Excavation (Lagoons 1-3)	44	days	$1,175	$51,700	Assumes 1 Two Man Crew with a Foam Spray
6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Remove and Dispose Offsite
3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	Emission Control During Mixing and Excavation - Non-Pit F Pits	12	days	$1,175	$14,000	Assumes 1 Two Man Crew with a Foam Spray
66	Pit F Area - Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Remove and Dispose Offsite
15	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
138	**Subtotal**	**85,000**			**$11,491,000**	
	Remove All Waste/Impacted Materials in City Parcel along Hamilton and Magnolia and Drilling Mud in Lagoons 4 and 5 down to Street Elevation					
64	Stabilize Lagoon 1 to 3 Before Covering	40,000	cy	$35	$1,400,000	Use Cement Admixture to Stabilize 5 Feet Deep Over 5 Acres (Lagoons 4 and 5, if removed to street level, will have approx. 1 ft. of drilling mud remaining)
	Vapor Control for Lagoon Stabilization	65	days	$1,175	$76,000	Provide 2 Man Crew Plus Pump and Chemicals
26	Lagoon 4 - Drilling Muds - Cal Haz disposal	33,000	cy	$66	$2,178,000	Remove to Street Level, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
12	Lagoon 5 - Drilling Muds - Cal Haz disposal	15,000	cy	$66	$990,000	Remove to Street Level, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
165	Sprung Structure for Excavating Lagoon 4 and 5 Drilling Muds	109,000	sq ft	$50	$5,450,000	Sprung Structure is 2.5 acre (size of Lagoon 4/5)
16	Impacted Fill Soils - non-pit - Cal Haz Disposal	20,000	cy	$81	$1,620,000	Assumes Offsite Disposal as Cal Haz
18	Highly Liquid Drilling Muds - non-pit - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
0	Drilling Muds - unsaturated - Cal Haz Disposal	0	cy	$71	$0	Insufficient Data to Assume Part is Non Hazardous
0	Minimally Impacted Soils - Mix with Highly Liquid Drilling Muds and Dispose Offsite	0	cy	$81	$0	17,500 cy required for mixing at 25% with drilling muds in berms and Lagoons 4 and 5 can be satisfied with soil excavated from berms.
0	Minimally Impacted Soils - Use for Cap Foundation, Backfilling	0	cy	$12	$0	
18	Crush Concrete Construction Debris & Use Onsite	23,000	cy	$30	$690,000	Crush and use under cap or during backfilling
0	Impacted Native Clay - Cal Haz Disposal	0	cy	$81	$0	
319	**Subtotal**	**90,000**	**cy**		**$13,966,000**	
49	**Rule 1166 Wastes Generated During Site Grading**	**10%**	**123,000**	**$77**	**$941,000**	Assumes a Percentage of Materials Disturbed by Grading Requires Offsite Disposal (50% as Cal Haz, 50% as Non Haz)
	Total Waste Removal	**187,000**	**cy**		**$26,398,000**	

Table R-10
Costs for Alternative No. 4 - Partial Source Removal with Protective (Multilayer) Cap
(Conservative)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Multilayer Cap over 38 Acres					
20	Geomembrane Materials	1,655,280	sq ft	$0.70	$1,159,000	60 mil HDPE liner
	Geosynthetic Clay Liner	1,655,280	sq ft	$0.70	$1,159,000	
	Drainage Layer	1,655,280	sq ft	$0.65	$1,076,000	using geocomposite drainage layer
	Biotic Layer Imported Materials Only - Use Geonet	1,655,280	sq ft	$0.45	$745,000	Use geonet
126	Earthwork - Pipe Trench Excavation, Backfill, Compaction	650	cy	$210	$137,000	
	Install Gas Collection System Piping (including geonet)	1	ls	$2,000,000	$2,000,000	6" HDPE headers and laterals & connect to blower
	Install Gas/Condensate Control System	1	ls	$250,000	$250,000	Install concrete pad, blower skid and enclosure, and electrical supply
	Vapor Treatment System	1	LS	$250,000	$250,000	Supply and install thermal oxidizer
146	**Subtotal Cap Installation**				**$6,776,000**	
604	**Total Construction**	**187,000**	**cy**		**$33,174,000**	
Additional Construction Time	**General Activities**	**Design/ Permitting/ Construction Management/ Backfilling & Grading**				
38 Months	Project Services	42	months	$113,000	$4,746,000	Increased 10% for Rain Days
	Design Permitting @ 10% of Construction Costs	1	LS	$3,223,300	$3,223,000	
	Mobilization @ 5% of Construction Costs	1	LS	$1,611,650	$1,612,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	882	work days	$1,400	$1,235,000	
	Air Monitoring	882	work days	$1,900	$1,676,000	
	QA/QC	882	work days	$2,100	$1,852,000	
	Site Water Management	21,000,000	gal	$0.10	$2,100,000	
2 Months	Final Site Grading - Cap Construction	123,000	cy	$12	$1,476,000	2 feet over 38 Acre Cap; Unit Cost Includes Sampling These Materials
	Surface Water Management System	1	LS	$100,000	$100,000	
8 Months	Backfill and Grade - Imported Soils	229,000	cy	$20	$4,580,000	Clean import soil required for cap cover (4' over 38 acres) and Pit F and Lagoons 1-3 backfill
	Seeding	38	Acre	$2,000	$76,000	Hydroseed
	Install New Fence Around Entire Site	5,600	LF	$20	$112,000	
	Demobilization	1	LS	$322,330	$322,000	
	Survey	1	LS	$50,000	$50,000	
	Subtotal General Activities				**$23,219,000**	
	Install 1.75 acre multilayer cap over South Coast Oil Corp. leased property	**1**	**LS**	**$1,150,000**	**$1,150,000**	Install 3 foot soil cover, geomembrane/GCL and gas collection and control system
	Subtotal All Construction Activities				**$57,543,000**	
	Contingency	**1**	**LS**	**$2,877,000**	**$2,820,000**	
	Total Capital Costs				**$60,363,000**	
	O&M				**$20,553,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$80,916,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-10
Costs for Alternative No. 4 - Partial Source Removal with Protective (Multilayer) Cap
(Conservative)
Ascon Landfill Site

Alternative 4 Conservative Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - All Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - Cal Haz - due to leachable lead and Non Haz; TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density = 1 ton/cy

Waste Handling/Processing

1 Pump All Lagoon Liquids (1, 2 and 3) and Dispose as a Liquid Waste by Fuel Blending
2 Unit Rate for Tarry Liquids Disposal Includes Chemicals Required to Make These Wastes Pumpable
3 Volume of Tarry Liquids Assumes a 10% Increase in Liquid Volume to Account for Chemical Addition to Make Waste Pumpable
4 Stabilize Lagoons 1, 2 and 3 (5 Acres) (After Draining, and Before Infilling) by Using a Cement-Based Admixture and a Hydraulic Mixing Head Suspended from a Large Crane
5 Suppressants Are Required During Mixing in the Cement Admixtures into the Lagoon Surface Materials, and Excavation and Mixing of Pit and Lagoon (1-3) Materials
6 Assumes General Grading Encounters 10% of the Materials Disturbed as Exceeding Rule 1166 and the Waste Materials are Disposed Offsite as Non Hazardous and California Hazardous
7 2.5 acre sprung structure is required for Lagoons 4 and 5 to complete excavation of drilling mud; construction time is for erection/dismantling of structure
8 100' x 100' sprung structure required for Pit F excavation; construction time is for erection and dismantling of structure
9 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Parcel and Drilling Muds in Lagoons 4 and 5 to Street Elevation (4 ft AMSL)
2 Install Multilayer Cap over entire Site, including areas where source is removed to street grade
3 Use Imported Soils to Cover the Entire Site with 3 Feet of Soil Over Cap, Plus Backfilling Pit F and Lagoons 1-3
4 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
5 Assumes that Remaining Pit Materials are Present within the Site Boundaries
6 Assumes Final Agreement will Include Land Use Limitations for the Site
7 O&M Costs Consist of 30 Years of Site Maintenance, Monitoring/Reporting, and Project Oversight
8 Install 1.75 acre multilayer cap over South Coast Oil Corporation leased property
9 Assumes that "minimally impacted soils" (that contain lead impacts) can be reused under Site cap
10 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
11 Install gas collection and control system (GCCS) with thermal oxidizer treatment system

Table R-11
Costs for Alternative No. 4 - Partial Source Removal with Protective (Multilayer) Cap
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping/ Stabilization Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
	Excavate Lagoon Tars and Pits A - H					
7	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	9,000	cy	$71	$639,000	Mix with 50% Soil (See Below), Excavate and Dispose Offsite as Cal Haz
9	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	11,000	cy	$71	$781,000	Same as above
4	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	5,000	cy	$71	$355,000	Same as above
	Emission Control During Mixing and Excavation	20	days	$1,175	$23,500	Assumes 1 Two Man Crew with a Foam Spray
6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Remove and Dispose Offsite
3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	Emission Control During Mixing and Excavation	13	days	$1,175	$15,000	Assumes 1 Two Man Crew with a Foam Spray
66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Remove and Dispose Offsite
	Emission Control During Mixing and Excavation	65	days	$2,350	$153,000	Assumes 1 Two Man Crew with a Foam Spray
98	**Subtotal**	**82,000**	**cy**		**$6,071,000**	
	Remove All Waste/Impacted Materials in City Parcel along Hamilton and Magnolia and Drilling Mud in Lagoons 4 and 5 down to Street Elevation					
25	Filter Geotextile Layer	217,800	sq ft	$0.15	$33,000	8 oz fabric on both sides of biotic layer and in pipe trenches
	GeoGrid	217,800	sq ft	$1	$218,000	8 oz fabric on both sides of biotic layer and in pipe trenches
26	Lagoon 4 - Drilling Muds - Cal/Non Haz disposal	33,000	cy	$66	$2,178,000	Remove to Street Elevation, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
12	Lagoon 5 - Drilling Muds - Cal/Non Haz disposal	15,000	cy	$66	$990,000	Remove to Street Elevation, Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
16	Impacted Fill Soils - Cal Haz Disposal	20,000	cy	$81	$1,620,000	Dispose Offsite as Cal Haz
0	Impacted Fill Soils - non-pit - Reuse Onsite	0	cy	$12	$0	Assume this Material is Placed Under Cap
18	Highly Liquid Drilling Muds - non-pit - Cal Haz Disposal	22,000	cy	$71	$1,562,000	Mix with Impacted Soil from Berm Area, Excavate and Dispose Offsite
0	Drilling Muds - unsaturated - Cal Haz Disposal	0	cy	$71	$0	Insufficient Data to Assume Part is Non Hazardous
10	Impacted Fill Soils - Reuse in mixing with lagoon tarry liquids (Cal Haz)	13,000	cy	$81	$1,053,000	Use Cal Haz Impacted Soil
0	Impacted Fill Soils - Reuse in mixing with L4 and L5 drilling muds (Non Haz)	0	cy	$72	$0	Not required - Soils required for mixing with Lagoon 4 and 5 and berm drilling muds (17.5K) from excavation of berms
0	Fill Soils - "Minimal TPH Impact" - Use For Cap Foundation	0	cy	$12	$0	Reuse onsite for cap foundation
18	Crush Concrete Construction Debris & Use Onsite	23,000	cy	$30	$690,000	Use Under Cap for Foundation Material
0	Impacted Native Clay - Cal Haz Disposal	0	cy	$72	$0	Not removing native clay
126	**Subtotal**	**103,000**	**cy**		**$8,344,000**	
0	**Rule 1166 Wastes Generated During Site Grading**	**0%**	**cy**	**$0**	**$0**	**Assumes a Percentage of Materials Disturbed by Grading Requires Offsite Disposal**
	Total Waste Removal	**185,000**	**cy**		**$14,415,000**	

Table R-11
Costs for Alternative No. 4 - Partial Source Removal with Protective (Multilayer) Cap
(Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
	Multilayer Cap over 38 acres					
20	Geomembrane Materials	1,655,280	sq ft	$0.70	$1,159,000	60 mil HDPE liner
	Geosynthetic Clay Liner	1,655,280	sq ft	$0.70	$1,159,000	
	Drainage Layer	1,655,280	sq ft	$0.65	$1,076,000	using geocomposite drainage layer
	Biotic Layer - Use Geonet	1,655,280	sq ft	$0.45	$745,000	Use Geonet
126	Earthwork - Pipe Trench Excavation, Backfill, Compaction	650	cy	$169	$110,000	
	Install Gas Collection System Piping (including geonet)	1	ls	$1,800,000	$1,800,000	
	Install Gas/Condensate Control System	1	ls	$225,000	$225,000	
	Vapor Treatment System	1	LS	$100,000	$100,000	Install Granular Activated Carbon System
146	**Subtotal Cap Installation**				**$6,374,000**	
370	**Total Construction**	**185,000**	**cy**		**$20,789,000**	
Additional Construction Time	**General Activities**	**Design/ Permitting/ Construction Management/ Backfilling & Grading**				
	Purchase Easement	1.65	Acre	$0.00	$0	
28 Months	Project Services	31	months	$113,000	$3,503,000	Increased 10% for Rain Days
	Design Permitting @ 10% of Construction Costs	1	LS	$2,079,000	$2,079,000	
	Mobilization @ 5% of Construction Costs	1	LS	$1,039,500	$1,040,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	651	work days	$1,400	$911,000	
	Air Monitoring	651	work days	$1,900	$1,237,000	
	QA/QC	651	work days	$2,100	$1,367,000	
	Site Water Management	15,500,000	gal	$0.10	$1,550,000	
2 Months	Final Site Grading (2 Feet Over 38 Acre Cap + Lagoon Infill)	148,000	cy	$12	$1,776,000	
	Surface Water Management System	1	LS	$100,000	$100,000	
	Reuse of Minimally Impacted Site Soils: Relocation and Backfill/Compaction	23,000	cy	$0	$0	
9 Months	Backfill and Grade - Imported Soils	225,000	cy	$20	$4,500,000	Clean import fill required for cap cover and Pit F
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Entire Site	5,600	feet	$20	$112,000	
	Demobilization	1	LS	$207,900	$208,000	
	Survey	1	LS	$50,000	$50,000	
	Subtotal General Activities				**$18,568,000**	
	Install 1.75 acre multilayer cap over South Coast Oil Corp. leased property	**1**	**LS**	**$1,150,000**	**$1,150,000**	Install 3 foot soil cover, geomembrane/GCL and gas collection and control system
	Subtotal All Construction Activities				**$40,507,000**	
	Contingency	**1**	**LS**	**$2,025,000**	**$1,968,000**	
	Total Capital Costs				**$42,475,000**	
	O&M				**$20,553,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$63,028,000**	

Table R-11
Costs for Alternative No. 4 - Partial Source Removal with Protective (Multilayer) Cap
(Best Case)
Ascon Landfill Site

[(1)] For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Alternative 4 Best Case Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for offsite disposal as daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - All Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - Cal Haz/Non Haz - due to leachable lead, TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy

Waste Processing/Handling

1 Mix Lagoon Tarry Liquids (1, 2 and 3) and Highly Liquid Drilling Muds with Impacted Soils and Dispose as a Solid Waste
2 Volumes for Tarry Liquids Disposal Includes Mixed Impacted Soils
3 Assumes a 50% Increase in Tarry Liquids Volume, and a 25% Increase in High Liquid Drilling Mud Volume to Account for Mixing with Impacted Soil
4 Stabilize Lagoons 1, 2 and 3 (5 Acres) Before Backfilling Using Site Soils, Geomembrane and Geofabric Materials
5 Use Foam Spray or Mists for Vapor Control While Mixing in the Site Soils into the Lagoon Surface Materials and Excavation of Pits
6 Waste Materials Encountered During Grading that Exceed Rule 1166 Limits Can Be Placed Under Site Cap
7 Highly Liquid Drilling Muds in Berm and Lagoons 4 and 5 Can be Mixed with Impacted Soils Found in Berm

Scope/General

1 Remove Berm Materials (Soils and Highly Liquid Drilling Muds) Off of City Property and Drilling Muds in Lagoons 4 and 5 to Street Elevation (4 ft AMSL)
2 Install Multilayer Cap over entire Site, including areas where source is removed to street grade
3 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
4 Asssumes that Remaining Pit Materials are Present within the Site Boundaries
5 Assumes Final Agreement will Include Land Use Limitations for the Site
6 O&M Costs Consist of 30 Years of Post Closure Site Maintenance, Monitoring/Reporting, and Project Oversight
7 Install 1.75 acre multilayer cap over South Coast Oil Corporation leased property
8 Assumes that "minimally impacted" site soils that could include lead impacts can be reused under Site Cap.
9 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
10 Install gas collection and control system (GCCS) with Granular activated carbon (GAC) treatment

Table R-12
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT (Conservative)
Ascon Landfill Site

Projected Time Frame		Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
		Assumed Rates					
		Liquid Production Rate (cy/day)	625				
		Clean Fill Production Rate (cy/day)	2500				
		Impacted Soil Production Rate (cy/day)	1250				
Implementation Period (Days)		**Maximum Pumping Rate (CY /Day)**	**250**	**Assumes 1 Onsite Well**			
SIT Pumping	**Solid Materials Disposed Offsite**	**Lagoon Liquids and Pits Removed**					
40		Lagoon 1 - Tarry Liquids	10,000	cy	$35	$350,000	Pump to SIT
52		Lagoon 2 - Tarry Liquids	13,000	cy	$35	$455,000	Pump to SIT
20		Lagoon 3 - Tarry Liquids	5,000	cy	$35	$175,000	Pump to SIT
	6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Remove and Dispose Offsite
	3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
		Emission Control for Non-Pit F Pits	13	days	$1,175	$15,040	
	15	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
	66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Same as above
112		**Subtotal Pumpable Liquids**	**28,000**	**cy**		**$980,000**	
	93	**Subtotal Non Pumpable Materials**	**57,000**	**cy**		**$4,369,000**	
		Subtotal - Lagoon Liquids and Pits				**$5,349,000**	

Table R-12
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT (Conservative)
Ascon Landfill Site

Projected Time Frame		Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
SIT Pumping	**Solid Materials Disposed Offsite**	**Waste Streams Removed**	**Slurry Injection Technology to be Used for Disposal of All Drilling Muds Up to Capacity of Well(s). All Impacted Soils and Drilling Muds are Cal Haz.**				
152		Lagoon 4 - Drilling Muds	38,000	cy	$35	$1,330,000	Pump to SIT
84		Lagoon 5 - Drilling Muds	21,000	cy	$35	$735,000	Pump to SIT
	233	Impacted Fill Soils - non-pit - Cal Haz Disposal	291,000	cy	$81	$23,571,000	All material will be excavated, transported and disposed at a Cal. Haz. Waste facility
1240		Highly Liquid Drilling Muds - non-pit	310,000	cy	$35	$10,850,000	Pump to SIT
744		Drilling Muds - unsaturated	186,000	cy	$35	$6,510,000	Pump to SIT, If Sufficient Volume is Available, If Not Dispose Offsite
	146	Fill Soils - Minimal Impact - Excavate and Dispose Offsite as Cal Haz	364,000	cy	$88	$32,032,000	
	55	Concrete Construction Debris - Reuse Onsite	69,000	cy	$30	$2,070,000	Crush and Reuse to Backfill Site
	49	Impacted Native Clay - Cal Haz Disposal	61,000	cy	$81	$4,941,000	1 foot over the site
		Pumpable Liquids and Drilling Muds	**555,000**	**cy**			
	482	**Subtotal Non Pumpable Materials**	**785,000**	**cy**		**$62,614,000**	
2220		**Subtotal Pumpable Volume**	**583,000**	**cy**		**$19,425,000**	**Exceeds One Well Volume**
		Maximum Volume Available For Injection	**550,000**	**cy**	**Assumes only 1 Well Volume is Available at the Site because of Nearby Fault**		
	26	**Offsite Disposal Required for Drilling Muds**	**33,000**	**cy**	**$36**	**$1,188,000**	**Additional Disposal Cost Required (Unit Cost is Difference Between Cal Haz Solid and SIT Disposal)**
2088		**Revised Pumping Time Frame**					
	509	**Revised Solids Handling Time Frame**					
		Total Non Pumpable Materials	**875,000**	**cy**		**$68,171,000**	
		Total Pumpable Volume	**550,000**	**cy**		**$20,405,000**	
2200	**602**	**Total Construction**	**1,425,000**	**cy**		**$88,576,000**	
73	**29**	**Construction Time (Months)**	**Assumes 24/7 SIT Pumping Operation to Reduce Implementation Time Frame**				
	SIT Preparation and Operation Activities		**Pilot Testing, Permitting, SIT Plant Construction and Power Costs**				
6		SIT Pilot Test	1	LS	$3,000,000	$3,000,000	Based on TerraLog FS Report
3		Install 1 SIT Wells (Production Rate is 250 cy /day/well)	1	LS	$750,000	$750,000	
24		SIT Permitting for Class I Hazardous Waste Well	1	LS	$1,000,000	$1,000,000	
3		Construct SIT Pumping Plant	1	LS	$1,000,000	$1,000,000	
		SIT Excavation, Handling & Emissions Control	550,000	cy	$20	$11,000,000	
		SIT Power Costs	73	$/Month	$8,000	$586,667	
36		**Subtotal SIT Installation + Operation**	**Assumes 24/7 SIT Pumping Operation to Reduce Implementation Time Frame**			**$17,337,000**	

Table R-12
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT (Conservative)
Ascon Landfill Site

Projected Time Frame		Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
109	29	**General Activities**					
	36	Project Services	40	months	$113,000	$4,520,000	Increase 10% for Rain Days
		Design Permitting @ 5% of Construction Costs	1	LS	$4,428,800	$4,428,800	
		Mobilization @ 5% of Construction Costs	1	LS	$4,428,800	$4,428,800	
		Clearing and Grubbing	27	Acre	$2,200	$59,400	
		Health and Safety	840	work days	$1,400	$1,176,000	
		Air Monitoring	840	work days	$1,900	$1,596,000	
		QA/QC	840	work days	$2,100	$1,764,000	
		Site Water Management	20,000,000	gal	$0.10	$2,000,000	
	2	Final Site Grading	123,000	cy	$12	$1,476,000	
		Surface Water Management System	1	LS	$100,000	$100,000	
	5	Import Soil for Backfilling Clean Close Areas	268,000	cy	$20	$5,360,000	
		Demobilization	1	LS	$885,760	$885,760	
		Survey	1	LS	$50,000	$50,000	
69		Additional SIT Support (Months)	69	Months	$59,200	$4,104,533	
		Additional SIT Water Management	34,667,000	gal	$0.10	$3,466,700	
		Subtotal General Activities				**$35,416,000**	
		Subtotal All Construction Activities				**$141,329,000**	
		Contingency @ 5% of All Construction Costs	**1**	**LS**	**$7,066,000**	**$7,066,000**	
		Total Capital Costs				**$148,395,000**	
		O&M				**$4,571,000**	**30 Year NPV Cost**
		Total 30 Year Life Cycle Cost				**$152,966,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-12
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT (Conservative)
Ascon Landfill Site

Alternative 5 Conservative Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - All Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - All Cal Haz - due to leachable lead, TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy
7 Minimally (TPH) Impact Site Soils - All Cal-Haz - due to leachable lead (per EA)

Material Processing

1 Remove All Berm Materials
2 Use imported soils (crushed concrete allowed) to backfill site to street grade
3 Inject via SIT all tarry liquids and highly liquid drilling muds, and most unsaturated drilling muds
4 100' x 100' sprung structure required for Pit F excavation; construction time is for erection and dismantling of structure
5 2.5 acre sprung structure is required for Lagoons 4 and 5 to complete excavation of drilling mud; construction time is for erection/dismantling of structure

Scope/General

1 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
2 Asssumes that Remaining Pit Materials are Present within the Site Boundaries
3 OM&M Costs to Consist of 30 Years of Post Closure Site Maintenance, Site Monitoring/Reporting, and Project Oversight
4 SIT costs do not include costs for makeup water - expected to be approx. 200,000 gallons per day
5 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)

Table R-13
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT
(Best Case)
Ascon Landfill Site

Projected Time Frame		Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
		Assumed Rates					
		Liquid Production Rate (cy/day)	625				
		Clean Fill Production Rate (cy/day)	2500				
		Impacted Soil Production Rate (cy/day)	1250				
Implementation Period (Days)		**Maximum Pumping Rate (CY /Day)**	**500**	**Assumes 2 Onsite Wells**			
SIT Pumping	**Solid Materials Disposed Offsite**	**Lagoon Liquids and Pits Removed**					
20		Lagoon 1 - Tarry Liquids	10,000	cy	$35	$350,000	Pump to SIT
26		Lagoon 2 - Tarry Liquids	13,000	cy	$35	$455,000	Pump to SIT
10		Lagoon 3 - Tarry Liquids	5,000	cy	$35	$175,000	Pump to SIT
	6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Remove and dispose offsite
	3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
		Emissions Control for Non-Pit F Pits	13	days	$1,175	$15,000	
		Emissions Control for Pit F	65	days	$1,230	$80,000	
	66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Same as above
56		**Subtotal Pumpable Liquids**	**28,000**	**cy**		**$980,000**	
	78	**Subtotal Non Pumpable Materials**	**57,000**	**cy**		**$4,199,000**	
		Subtotal - Lagoon Liquids and Pits				**$5,179,000**	

Table R-13
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT
(Best Case)
Ascon Landfill Site

Projected Time Frame		Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
		Waste Streams Removed	**Slurry Injection Technology to be Used for Disposal of All Drilling Muds Up to Capacity of Well(s). 50% of Impacted Soils are Cal Haz, 50% are Non Haz.**				
76		Lagoon 4 - Drilling Muds	38,000	cy	$35	$1,330,000	Pump to SIT
42		Lagoon 5 - Drilling Muds	21,000	cy	$35	$735,000	Pump to SIT
	117	Impacted Fill Soils - non-pit	146,000	cy	$81	$11,826,000	Disposed as Cal Haz
	117	Impacted Fill Soils - non-pit	146,000	cy	$72	$10,439,000	Disposed as Non Haz
620		Highly Liquid Drilling Muds - non-pit	310,000	cy	$35	$10,850,000	Pump to SIT
372		Drilling Muds - unsaturated	186,000	cy	$35	$6,510,000	Pump to SIT
	146	Fill Soils - Minimal Impact	364,000	cy	$7	$2,548,000	Excavate and test to determine stabilization requirement
	55	Concrete Construction Debris & Reuse Onsite	69,000	cy	$30	$2,070,000	Crush and Reuse Onsite
	12	Impacted Native Clay - Cal Haz and Non Haz Disposal	15,000	cy	$76	$1,144,000	1/2 foot over 1/2 of Site
		Pumpable Liquids and Drilling Muds	**555,000**	**cy**			
	446	**Subtotal Non Pumpable Materials**	**740,000**	**cy**		**$28,027,000**	
1110		**Subtotal Pumpable Volume**	**583,000**	**cy**		**$19,425,000**	**Total Volume Can Not Fit Into Site Area Because of Nearby Fault**
		Maximum Volume Available For Injection	**550,000**	**cy**	**Assumes only 1 Well Volume is Available at the Site because of Nearby Fault**		
	26	**Offsite Disposal Required for Drilling Muds**	**33,000**	**cy**	**$36**	**$1,188,000**	**Additional Disposal Cost Required (Unit Cost is Difference Between Cal Haz Solid and SIT Disposal)**
1044		**Revised Pumping Time Frame**					
	473	**Revised Solids Handling Time Frame**					
		Total Non Pumpable Materials	**830,000**	**cy**		**$32,226,000**	
		Total Pumpable Volume	**550,000**	**cy**		**$20,405,000**	
1100	551	**Total Construction**	**1,380,000**	**cy**		**$52,631,000**	
37	26	**Construction Time (Months)**					
SIT Preparation and Operation Activities			**Pilot Testing, Permitting, SIT Plant Construction and Power Costs**				
6		SIT Pilot Test	1	LS	$3,000,000	$3,000,000	Based on TerraLog FS Report
3		Install 2 SIT Wells (Production Rate is 250 cy /day/well)	2	LS	$750,000	$1,500,000	Assumed 2 Wells Were Required and 24/7 Operation to Reduce Implementation Time Frame
24		SIT Permitting for Class I Hazardous Waste Well	1	LS	$1,000,000	$1,000,000	
3		Construct SIT Pumping Plant	1	LS	$1,000,000	$1,000,000	
		SIT Excavation, Handling & Emissions Control	550,000	cy	$20	$11,000,000	
		SIT Power Costs	37	$/Month	$16,000	$587,000	
36		**Subtotal SIT Installation + Operation**	**Assumes 24/7 SIT Pumping Operation**			**$18,087,000**	

Table R-13
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT
(Best Case)
Ascon Landfill Site

Projected Time Frame		Project Area	Quantity	Units	Unit Cost(1)	Total Cost	Assumptions
73	**26**	**General Activities**					
	26	Project Services	29	months	$113,000	$3,277,000	Increase 10% for Rain Days
		Design Permitting @ 5% of Construction Costs	1	LS	$2,631,550	$2,632,000	
		Mobilization @ 5% of Construction Costs	1	LS	$2,631,550	$2,632,000	
		Clearing and Grubbing	27	Acre	$2,200	$59,000	
		Health and Safety	609	work days	$1,400	$853,000	
		Air Monitoring	609	work days	$1,900	$1,157,000	
		QA/QC	609	work days	$2,100	$1,279,000	
		Site Water Management	14,500,000	gal	$0.10	$1,450,000	
	2	Final Site Grading	123,000	cy	$5	$615,000	2 feet over 38 acres
		Surface Water Management System	1	LS	$100,000	$100,000	
		Stabilize and Reuse Minimal Impact Soil	238,000	cy	$30	$7,140,000	
		Excess Minimally Impacted Soil	126,000	cy	$88	$11,088,000	Dispose offsite as Cal Haz (Spread out would be 2' over entire site)
	0	Import Soil for Backfilling Clean Closed Areas	0	cy	$20	$0	
		Demobilization	1	LS	$526,000	$526,000	
		Survey	1	LS	$50,000	$50,000	
44		Additional SIT Support (Months)	44	Months	$59,000	$2,576,000	
		Additional SIT Water Management	21,833,000	gal	$0.10	$2,183,000	
		Subtotal General Activities				**$37,617,000**	
		Subtotal All Construction Activities				**$108,335,000**	
		Contingency @ 5% of All Construction Costs	**1**	**LS**	**$5,417,000**	**$5,417,000**	
		Total Capital Costs				**$113,752,000**	
		O&M				**$4,571,000**	**30 Year NPV Cost**
		Total 30 Year Life Cycle Cost				**$118,323,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-13
Costs for Alternative No. 5
Source Removal with Offsite Disposal and SIT
(Best Case)
Ascon Landfill Site

Alternative 5 Best Case Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - Cal-Haz/Non-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - 50% Non Haz/50% Cal Haz - due to leachable lead, TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy
7 Minimally (TPH) Impact Site Soils - All Cal-Haz - due to leachable lead (per EA)

Material Processing

1 Use Pb-Stabilized Minimally Impacted Soils and Crushed Concrete to Backfill Site to Street Grade
2 Most drilling muds (subject to volume limitation) and tarry liquids injected via SIT

Scope/General

1 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
2 Asssumes that Remaining Pit Materials are Present within the Site Boundaries
3 OM&M Costs to Consist of 30 Years of Post Closure Site Maintenance, Monitoring/Reporting, and Site Oversight
4 SIT costs do not include costs for makeup water - expected to be approx. 200,000 gallons per day
5 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)

Table R-14
Costs for Alternative No. 6
(Conservative) - Source Removal with Offsite Disposal
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost (1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
	Remove All Lagoon and Pit Wastes					
16	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	2,062,000	Gal	$1.25	$2,578,000	Mix Additives, Pump and Dispose as Fuel Blending
20	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	2,546,000	Gal	$1.25	$3,183,000	Same as above
8	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	1,048,000	Gal	$1.25	$1,310,000	Same as above
6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Excavate and Dispose
3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	Emission Controls - Non-Pit F Pits and Tarry Liquids	57	days	$1,175	$67,000	
3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose
15	Sprung Structure for Excavating Pit F	10,000	sq ft	$25	$250,000	Sprung Structure is 100' x 100' (100% greater in size than Pit F footprint)
123	**Subtotal**	**85,000**	cy		**$11,492,000**	
	Waste Streams Removed	**All Drilling Muds and Impacted Soils Disposed as Cal Haz; Use Minimally Impacted Soil for Mixing with Drilling Muds and Tars**				
30	Lagoon 4 - Drilling Muds - Cal Haz Disposal	38,000	cy	$66	$2,508,000	Mix with 25% Minimally Impacted Soil and Dispose as Cal Haz; Note: Soil Disposal Broken Out Separately Below
17	Lagoon 5 - Drilling Muds - Cal Haz Disposal	21,000	cy	$66	$1,386,000	Mix with 25% Minimally Impacted Soil and Dispose as Cal Haz; Note: Soil Disposal Broken Out Separately Below
165	Sprung Structure for Excavating Lagoon 4 and 5 Drilling Muds	109,000	sq ft	$50	$5,450,000	Sprung Structure is 2.5 acre (size of Lagoon 4/5)
233	Impacted Fill Soils - non-pit - Cal Haz Disposal	291,000	cy	$81	$23,571,000	All material will be excavated, transported and disposed as Cal-Haz
248	Highly Liquid Drilling Muds - non-pit - Cal Haz Disposal	310,000	cy	$71	$22,010,000	Mix with 25% Minimally Impacted Soil and Dispose as Cal Haz
74	Soil to Mix with High Liquid Drilling Muds (Lagoon and Non-Lagoon)	92,250	cy	$81	$7,472,000	Dispose as Cal Haz
149	Drilling Muds - unsaturated - Cal Haz Disposal	186,000	cy	$71	$13,206,000	Excavate and Dispose
108	Fill Soils - Minimal Impact	271,000	cy	$88	$23,848,000	Dispose offsite as Cal Haz
55	Crush Concrete Construction Debris & Reuse Onsite	69,000	cy	$30	$2,070,000	Use to Backfill Clean Closed Areas
49	Impacted Native Clay - Cal Haz Disposal	61,000	cy	$81	$4,941,000	Assumes Average of 1 foot over Entire Site
1128	**Subtotal**	**1,270,000**			**$106,462,000**	
1251	**Total Construction Time (Days)**	**1,355,000**	**cy**		**$117,954,000**	
	Volume of Material Available for Reuse	**69,000**	**cy**			
	Volume Required for Site Grading & Backfill	**337,000**	**cy**			
	Deficit Volume to Import	**268,000**	**cy**			

Table R-14
Costs for Alternative No. 6
(Conservative) - Source Removal with Offsite Disposal
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost (1)	Total Cost	Assumptions
Additional Construction Time	**General Activities**					
65 Months	Project Services	72	months	$113,000	$8,136,000	Add 10% for Rain Days
	Design Permitting @5% of Construction Costs	1	LS	$5,897,700	$5,898,000	
	Mobilization @ 5% of Construction Costs	1	LS	$5,897,700	$5,898,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	1,512	work days	$1,400	$2,117,000	
	Air Monitoring	1,512	work days	$1,900	$2,873,000	
	QA/QC	1,512	work days	$2,100	$3,175,000	
	Site Water Management	36,000,000	gal	$0.10	$3,600,000	
1 Months	Final Site Grading	123,000	cy	$5	$615,000	
	Surface Water Management System	1	LS	$100,000	$100,000	
5 Months	Backfill and Grade - Required Import Fill	268,000	cy	$20	$5,360,000	Assumes Crushed Concrete Can Be Used as Site Backfill
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Capped Area (18 Acres)	2,800	feet	$20	$56,000	Check Unit Price with Recent Quotes
	Demobilization	1	LS	$1,180,000	$1,180,000	
	Survey	1	LS	$50,000	$50,000	
	Subtotal General Activities				**$39,193,000**	
	Remove Top 3 Feet of Material in South Coast Oil Corp. leased area (1.75 ac)	1	LS	$1,500,000	**$1,500,000**	Replace excavated materials with clean import, and regrade site
	Subtotal All Construction Activities				**$158,647,000**	
	Contingency	**1**	**LS**	**$7,932,000**	**$7,932,000**	
	Total Capital Costs				**$166,579,000**	
	O&M				**$4,571,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$171,150,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-14
Costs for Alternative No. 6
(Conservative) - Source Removal with Offsite Disposal
Ascon Landfill Site

Alternative 6 Conservative Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - All Cal-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - All Cal Haz - due to leachable lead, TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy
7 Minimally (TPH) Impact Site Soils - All Cal-Haz - due to leachable lead (per EA)

Waste Processing/Handling

1 Pump All Lagoon Tarry Liquids (1, 2 and 3) and Dispose as a Liquid Waste by Fuel Blending
2 Unit Rate for Liquids Disposal Includes Chemicals Required to Make Oily Wastes Pumpable, Application & Pumping, Handling and Offsite T&D
3 Assumes a 10% Increase in Liquid Volume to Account for Chemical Addition to Make Waste Pumpable

Scope/General

1 Completely Remove All Drilling Muds, Lagoon Tarry Liquids and Pit Materials and Dispose Offsite
2 Use Imported Soil and Crushed Concrete to Backfill Site to Street Grade
3 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
4 Asssumes that Remaining Pit Materials are Present within the Site Boundaries
5 O&M Costs to be developed for 30 Years of Post Closure Care, Surface Water Monitoring, Groundwater Monitoring, Security and Reporting
6 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
7 Remove top 3 feet of materials and dispose offsite, replace with clean import fill, regrade

Table R-15
Costs for Alternative No. 6
Source Removal with Offsite Disposal (Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost (1)	Total Cost	Assumptions
	Assumed Rates					
	Liquid Pumping Rate (cy/day)	625				
	Clean Fill Production Rate (cy/day)	2500				
	Impacted Soil Production Rate (cy/day)	1250				
Days	**Remove All Lagoon and Pit Wastes**					
7	Lagoon 1 - Tarry Liquids - Cal Haz Disposal	9,000	cy	$71	$639,000	Mix with 50% Minimal Impact Soil and Dispose
9	Lagoon 2 - Tarry Liquids - Cal Haz Disposal	11,000	cy	$71	$781,000	Same as above
4	Lagoon 3 - Tarry Liquids - Cal Haz Disposal	5,000	cy	$71	$355,000	Same as above
6	Pits A, B and H - Non Haz Disposal	8,000	cy	$72	$576,000	Excavate and Dispose
3	Pits C, D and G - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
3	Pit E - Non Haz Disposal	4,000	cy	$72	$288,000	Same as above
	Emissions Control for Lagoons & Pits	33	days	$1,175	$39,000	
66	Pit F Area Impacted Soils - Non Haz Disposal	41,000	cy	$72	$2,952,000	Excavate and Dispose
	Emissions Control for Pit F	66	days	$2,350	$154,000	
98	**Subtotal**	**82,000**	cy		**$6,072,000**	
Days	**Waste Streams Removed**	**50% of Lagoon 4 and 5 Drilling Muds and Impacted Soils Disposed as Non-Hazardous**				
15	Lagoon 4 - Drilling Muds - Cal Haz Disposal	19,000	cy	$66	$1,254,000	Mix with 25% Minimal Impact Soil and Dispose as Cal Haz
15	Lagoon 4 - Drilling Muds - Non Haz Disposal	19,000	cy	$59	$1,121,000	Mix with 25% Minimal Impact Soil and Dispose as Non Haz
8	Lagoon 5 - Drilling Muds - Cal Haz Disposal	10,500	cy	$66	$693,000	Mix with 25% Minimal Impact Soil and Dispose as Cal Haz
8	Lagoon 5 - Drilling Muds - Non Haz Disposal	10,500	cy	$59	$620,000	Mix with 25% Minimal Impact Soil and Dispose as Non Haz
39	Impacted Fill Soils - non-pit - Cal Haz Disposal	49,000	cy	$81	$3,969,000	Volume not used for mixing
111	Impacted Fill Soils - non-pit - Non Haz	139,000	cy	$72	$9,939,000	Impacted Fill Soils - Non Haz
248	Highly Liquid Drilling Muds - non-pit	310,000	cy	$71	$22,010,000	Mix with 25% Minimal Impact Soil and Dispose as Cal Haz
78	Cal Haz Impacted Soil to Mix with Drilling Muds & Tarry Liquids	97,000	cy	$81	$7,857,000	Use Impacted Soil & Dispose Off Site as Cal Haz
6	Non Haz Impacted Soil to Mix with Drilling Muds	7,000	cy	$72	$501,000	Use Impacted Soil & Dispose Off Site as Non Haz
149	Drilling Muds - unsaturated	186,000	cy	$71	$13,206,000	Excavate and Dispose
146	Fill Soils - Minimal Impact	364,000	cy	$7	$2,548,000	Excavate and Test to Check for Need to Stabilize Prior to Use Onsite
55	Crush Concrete Construction Debris and Reuse Onsite as Backfill	69,000	cy	$30	$2,070,000	Use to Backfill Site
12	Impacted Native Clay	15,000	cy	$72	$1,080,000	Assumes Average of 0.5 foot over one-half of site
890	**Subtotal**	**862,000**			**$66,868,000**	
989	**Total Construction**	**1,070,000**	cy		**$72,940,000**	Includes excess minimally impacted soil (see General Activities)

Table R-15
Costs for Alternative No. 6
Source Removal with Offsite Disposal (Best Case)
Ascon Landfill Site

Projected Time Frame	Project Area	Quantity	Units	Unit Cost (1)	Total Cost	Assumptions
Additional Construction Time (Months)	**General Activities**					
56	Project Services	62	months	$113,000	$7,006,000	Add 10% for Rain Days
	Design Permitting @5% of Construction Costs	1	LS	$3,647,000	$3,647,000	
	Mobilization @ 5% of Construction Costs	1	LS	$3,647,000	$3,647,000	
	Clearing and Grubbing	27	Acre	$2,200	$59,000	
	Health and Safety	1,302	work days	$1,400	$1,823,000	
	Air Monitoring	1,302	work days	$1,900	$2,474,000	
	QA/QC	1,302	work days	$2,100	$2,734,000	
	Site Water Management	31,000,000	gal	$0.10	$3,100,000	
2	Final Site Grading	123,000	cy	$5	$615,000	
	Surface Water Management System	1	LS	$100,000	$100,000	
5	Stabilize and Reuse Minimally Impacted Soils	238,000	cy	$20	$4,760,000	
2	Dispose Excess Minimally Impact Soil	126,000	cy	$88	$11,088,000	
	Seeding	38	Acre	$2,000	$76,000	
	Install New Fence Around Capped Area (18 Acres)	2,800	feet	$20	$56,000	
	Demobilization	1	LS	$729,000	$729,000	
	Survey	1	LS	$50,000	$50,000	
	Subtotal General Activities				**$41,964,000**	
	Remove Top 3 Feet of Material in South Coast Oil Corp. leased area (1.75 ac)	1	LS	$1,500,000	**$1,500,000**	Replace excavated materials with clean import, and regrade site
	Subtotal All Construction Activities				**$116,404,000**	
	Contingency	**1**	**LS**	**$5,820,000**	**$5,820,000**	
	Total Capital Costs				**$122,224,000**	
	O&M				**$4,571,000**	**30 Year NPV Cost**
	Total 30 Year Life Cycle Cost				**$126,795,000**	

(1) For waste processing - Fully loaded rate includes handling (excavation or pumping and loading), sampling, mixing (if applicable) and transportation and offsite disposable (as applicable)

Table R-15
Costs for Alternative No. 6
Source Removal with Offsite Disposal (Best Case)
Ascon Landfill Site

Alternative 6 Best Case Assumptions

Waste Classification

1 Pits - All: Non-haz, OK for daily cover (TPH < 30K); density = 1.5 tons/cy
2 Lagoon 4 + 5 Drilling Muds - Cal-Haz/Non-Haz - due to leachable lead, TPH>30K; density = 1.1 tons/cy
3 Impacted Fill Soils (incl. Native Clay) - Cal Haz/Non Haz - due to leachable lead, TPH<30K; density = 1.5 tons/cy
4 Highly Liquid Drilling Muds - All Cal Haz - due to leachable lead; density = 1.2 tons/cy
5 Unsaturated Drilling Muds - All Cal Haz - due to leachable lead; density = 1.3 tons/cy
6 Lagoons 1-3 Tarry Liquids - All Cal-Haz - due to leachable lead; density - 1 ton/cy

Waste Processing/Handling

1 Remove All Berm Materials and Reuse Onsite or Dispose Offsite As Required by Chemical Impacts
2 Mix Lagoon Liquids (1, 2 and 3) and Pit F Liquids with Impacted Soils and Dispose as a Solid Waste
3 Volumes for Liquids Disposal Includes Mixed Impacted Soils
4 Assumes a 50% Increase in Liquid Volume, and a 25% Increase in Drilling Mud Volume to Account for Mixing with Impacted Soil
5 Completely Remove All Drilling Muds, Lagoon Liquids and Pit Materials and Dispose OffSite
6 Use Pb-Stabilized Minimally Impacted Soils and Crushed Concrete to Backfill Site to Street Grade
7 Assumes 50% of Impacted Soil and Lagoon 4 and 5 Drilling Muds are Non-Hazardous for Disposal
8 Assumes Non-Haz and Cal Haz Impacted Soils can be Mixed with Lagoon Tars and Drilling Muds as Appropriate

Scope/General

1 Assumes Pit F Waste Materials are Contained within the Current Site Boundaries
2 Asssumes that Remaining Pit Materials are Present within the Site Boundaries
3 O&M Costs to be developed for 30 Years of Post Closure Care, Surface Water Monitoring, Groundwater Monitoring, Security and Reporting
4 Waste stream volumes from Table 6.5-1 are rounded to nearest thousand after applying multipliers (as appropriate)
5 Remove top 3 feet of materials and dispose offsite, replace with clean import fill, regrade

Table R-16
SFS Remedy Cost Estimates (Life Cycle), Waste and Import Volumes, Truck Trips, and Remedy Durations
Ascon Landfill Site

Remedy Alternative	Remedy Description	Remedy Construction Cost	O&M Costs	Total 30 Year Life Cycle Cost	Avg. 30 Year Life Cycle Cost - Best and Conservative Cases	Volume of Waste Removed From Site [1]	Average Volume of Waste Removed from Site	Estimated # of Truck Trips (To/From Site) - Waste Removal (Assuming 17 cy Truck)	Volume of Import Soil Required	Estimated # of Truck Round Trips - Import Soil (Assuming 17 cy Truck)	Estimated # of Truck Trips To/From Site - Waste and Import (Assuming 17 cy Truck)	Average Estimated # of Truck Trips To/From Site - Waste and Import (Assuming 17 cy Truck)	Estimated Duration of Remedy Construction	Estimated Duration of Remedy Construction	Average Estimated Duration of Remedy Construction	Average Estimated Duration of Remedy
		($MM)	($MM)	($MM)	($MM)	(cy)	(cy)	(1,000 trucks)	(cy)	(1,000 trucks)	(1,000 trucks)	(1,000 trucks)	(months)	(years)	(months)	(years)
Alt 1	No Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2 Best Case	Limited Action	$14.4	$9.9	$24.3	$30.8	79,000	77,000	9	93,000	11	20	22	10	3/4	13	1
Alt 2 Conservative Case		$27.3	$9.9	$37.2		75,000		9	128,000	15	24		16	1 1/4		
Alt 3a Best Case	Protective Cap (Monolithic)	$27.1	$11.2	$38.3	$46.2	123,000	124,000	14	292,000	34	48	49	19	1 1/2	22	1 3/4
Alt 3a Conservative Case		$42.8	$11.2	$54.0		125,000		15	297,000	35	50		25	2		
Alt 3b Best Case	Protective Cap (Multilayer)	$40.8	$20.6	$61.3	$66.7	123,000	124,000	14	225,000	26	40	41	25	1 1/2	28	1 3/4
Alt 3b Conservative Case		$51.6	$20.6	$72.2		125,000		15	229,000	27	42		30	2		
Alt. 3 Best Case	Protective Cap	$27.1	$11.2	$38.3	$55.2	123,000	124,000	14	292,000	34	48	45	19	1 1/2	25	1 3/4
Alt. 3 Conservative Case		$51.6	$20.6	$72.2		125,000		15	229,000	27	42		30	2		
Alt. 4a Best Case	Partial Source Removal with Protective Cap (Monolithic)	$34.8	$11.2	$46.0	$54.7	185,000	186,000	22	292,000	34	56	56	27	2 1/4	33	2 3/4
Alt. 4a Conservative Case		$52.2	$11.2	$63.4		187,000		22	292,000	34	56		38	3 1/4		
Alt 4b Best Case	Partial Source Removal with Protective Cap (Multilayer)	$42.5	$20.6	$63.0	$72.0	185,000	186,000	22	225,000	26	48	49	31	2	37	2 1/2
Alt 4b Conservative Case		$60.4	$20.6	$80.9		187,000		22	229,000	27	49		42	3		
Alt 4 Best Case	Partial Source Removal with Protective Cap	$34.8	$11.2	$46.0	$63.5	185,000	186,000	22	292,000	34	56	53	27	2 1/4	35	2 1/2
Alt 4 Conservative Case		$60.4	$20.6	$80.9		187,000		22	226,000	27	49		42	3		
Alt 5 Best Case	Source Removal (Dispose Offsite and SIT)	$114	$4.6	$118	$135.6	523,000	664,500	62	0	0	62	95	73	6	91	7 1/2
Alt 5 Conservative Case		$148	$4.6	$153		806,000		95	268,000	32	127		109	9		
Alt 6 Best Case	Source Removal (Dispose Offsite)	$122	$4.6	$127	$149.0	1,070,000	1,212,500	126	126,000	15	141	166	62	5 1/4	67	5 1/2
Alt 6 Conservative Case		$167	$4.6	$171		1,355,000		159	268,000	32	191		72	6		

(1) For Alt 5 - Includes Only Solid Material Disposed

Table R-17
Summary of Waste Stream Handling, Transportation and Disposal Costs and Assumptions Related to Unit Pricing
Ascon Landfill Site

Waste Stream	Excavation & Loading ($/cy)	Sampling ($/cy)	Mixing (*Ex situ*) ($/cy)	T&D Conversion, ton--> cy [1]	T&D ($/ton) [2]	Unit Cost -1	Unit Cost - 2	Notes on Waste Classification
1.) Pits A-H (except F)	5	2	-	1.5	$43	$72	-	Assume non-haz (per TTLC results, <30K TPH); no leach results - will require confirmation sampling during remedy.
2.) Pit F soils (except liquid)	5	2	-	1.5	$43	$72		Assume non-haz (per TTLC and leach results), TPH >30K. Assume confirmation sampling required.
3.) Highly liquid drilling muds - Lagoons 4 and 5 [3]	5	2	5	1.1	$43 to $49	$59	$66	Disposal as non-haz or Cal Haz (due to leachable lead), TPH > 30K.
4.) Highly liquid drilling muds (Non-lagoon/Pit)	5	2	5	1.2	$49	$71	-	Disposal as Cal Haz due to leachable lead
5.) Unsaturated Drilling Muds	5	2	-	1.3	$49	$71	-	Disposal as Cal Haz due to leachable lead
6.) Non-Pit Impacted soils (including native clay) [3]	5	2	-	1.5	$43 to $49	$72	$81	Disposal as non-haz or Cal Haz (due to leachable lead), TPH < 30K.
7.) Lagoon 1-3 Tarry Liquids **(solid waste)**	5	2	5	1	$49	$61	-	Disposal as Cal Haz due to leachable lead

[1] From Table 6.5-1 of RFS
[2] From Cost Estimate for Ascon Emergency Action Work Provided by T&D Vendor
[3] Ranges for Highly Liquid Drilling Muds (Lagoons 4 and 5) and Non-Pit Impacted Soils correspond to the Best Case and Most Conservative Case assumptions for waste classification

Solid Waste Disposal
Production is based on 1250 cy (IS) to 2500 cy (clean fill) per day of excavation
There are 21 work days per month

Liquid Waste Disposal
Production is based on 625 cy per day
There are 21 work days per month

SIT
Production is based on 500 cy/day
There are 30 work days per month
See attached sheet for SIT details
Alt 6-Conservative - all tars, high liquid muds and some unsaturated drilling muds are injected (balance remaining is unsaturated)

In situ volumes (see Chapter 6, Table 6.4-1) are used
Site area is total of 38 acres
Clearing and grubbing area was constant at 27 acres, excluding Alternate 1
There are 12 inches of rain per year, which equals approximately 12,000,000 gal of rainfall on-site per year
50% of rainfall needs treatment
5% contingency used throughout all scenarios
All geosynthetic gap materials include 15% waste/overlap factor
HDPE collection piping includes installation
Leachate/vapor treatment system includes installation and treatment compound
ACL is mixed at a 6% (v/v) ratio. Price includes application, and materials