

**Appendix H**

Remedial Technology Cost Estimates

**TABLE H-1  
SOIL - INSTITUTIONAL AND ENGINEERING CONTROLS COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>SOIL - Institutional and Engineering Controls - Order of Magnitude Cost Estimate</b>								
<b>Items</b>	<b>Quantity</b>		<b>Units</b>	<b>Unit Cost</b>		<b>Total cost</b>		
	<b>low</b>	<b>high</b>		<b>low</b>	<b>high</b>	<b>low</b>	<b>high</b>	
<b>Capital</b>								
Paving	4,000	6,500	SF	\$ 18	\$ 25	\$ 72,000	\$ 162,500	
Fence Upgrades	1,000	2,500	LF	\$ 9	\$ 15	\$ 9,000	\$ 37,500	
Sampling - characterization and confirmation	3	6	sample	\$ 750	\$ 1,500	\$ 2,250	\$ 9,000	
<b>Total Capital Cost</b>						<b>\$ 81,000</b>	<b>\$ 200,000</b>	
<b>Capital cost/pound of contaminants</b>						<b>\$ 2,700</b>	<b>\$ 6,667</b>	
<b>Operation</b>								
Inspections (Labor and O & M)	48	48	year	\$ 1,000.00	\$ 1,500.00	\$ 48,000	\$ 72,000	
<b>Total Operational Cost</b>						<b>\$ 48,000</b>	<b>\$ 72,000</b>	
<b>Operational cost/pound of contaminants</b>						<b>\$ 1,600</b>	<b>\$ 2,400</b>	
<b>Maintenance</b>								
Fence Repairs	1,000	2,500	LF	\$ 9	\$ 15	\$ 9,000	\$ 37,500	
Paving Repairs	4,000	6,500	SF	\$ 18	\$ 25	\$ 72,000	\$ 162,500	
<b>Total Maintenance Cost</b>						<b>\$ 81,000</b>	<b>\$ 200,000</b>	
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 54</b>	<b>\$ 133</b>	
<b>Monitoring - None</b>								
<b>Total Monitoring Cost</b>						<b>\$ -</b>	<b>\$ -</b>	
<b>Monitoring cost/pound of contaminants</b>						<b>\$ -</b>	<b>\$ -</b>	
<b>Demolishing/Decommissioning (D&amp;D) - None</b>								
<b>Total D&amp;D Cost</b>						<b>\$ -</b>	<b>\$ -</b>	
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ -</b>	<b>\$ -</b>	

**TABLE H-2  
SOIL - EXCAVATION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>SOIL - Removal/Excavation - Order of Magnitude Cost Estimate</b>							
<b>Items</b>	<b>Quantity</b>		<b>Units</b>	<b>Unit Cost</b>		<b>Total cost</b>	
	<b>low</b>	<b>high</b>		<b>low</b>	<b>high</b>	<b>low</b>	<b>high</b>
<b>Capital</b>							
Excavation (low = 2.5 and high = 4 acres)	8,067	14,520	CY	7	15	\$ 56,467	\$ 217,800
Transport and Dispose	8,067	14,520	CY	\$ 26	\$ 50	\$ 209,733	\$ 726,000
Backfill and regrade	8,067	14,520	CY	\$ 5	\$ 15	\$ 40,333	\$ 217,800
Sampling - characterization and confirmation	30	60	sample	\$ 750	\$ 1,500	\$ 22,500	\$ 90,000
				<b>Total Capital Cost</b>		<b>\$ 329,033</b>	<b>\$ 1,251,600</b>
				<b>Capital cost/pound of contaminants</b>		<b>\$ 10,968</b>	<b>\$ 41,720</b>
<b>Operation None</b>							
				<b>Total Operational Cost</b>		<b>\$ -</b>	<b>\$ -</b>
				<b>Operational cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>
<b>Maintenance - None</b>							
				<b>Total Maintenance Cost</b>		<b>\$ -</b>	<b>\$ -</b>
				<b>Maintenance cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>
<b>Monitoring - None</b>							
				<b>Total Monitoring Cost</b>		<b>\$ -</b>	<b>\$ -</b>
				<b>Monitoring cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>
<b>Demolishing/Decommissioning (D&amp;D) - None</b>							
				<b>Total D&amp;D Cost</b>		<b>\$ -</b>	<b>\$ -</b>
				<b>D&amp;D cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>

**TABLE H-3  
GROUNDWATER SITE-WIDE - NATURAL ATTENUATION WITH MONITORING COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: Natural Attenuation with Monitoring - Order of Magnitude Cost Estimate</b>									
Items	Quantity		Units	Unit Cost		Total cost			
	low	high		low	high	low	high		
<b>Capital - Infrastructure - None</b>									
<b>Total Capital Cost</b>						\$	-	\$	-
<b>Capital cost/pound of contaminants</b>						\$	-	\$	-
<b>Operation</b>									
Modeling simulations (one per year or every other year based on annual sampling)	24	48	each	\$ 22,000	\$ 30,000	\$	528,000	\$	1,440,000
<b>Total Operational Cost</b>						\$	<b>528,000</b>	\$	<b>1,440,000</b>
<b>Operational cost/pound of contaminants</b>						\$	<b>352</b>	\$	<b>960</b>
<b>Maintenance</b>									
Well redevelopment (~15/year or every other year)	24	48	year	\$ 7,500	\$ 17,500	\$	180,000	\$	840,000
Well Repairs (~30/year or every other year)	24	48	year	\$ 5,000	\$ 20,000	\$	120,000	\$	960,000
Well replacement (1 to 2 wells/year)	24	48	year	\$ 3,000	\$ 6,500	\$	72,000	\$	312,000
<b>Total Maintenance Cost</b>						\$	<b>372,000</b>	\$	<b>2,112,000</b>
<b>Maintenance cost/pound of contaminants</b>						\$	<b>248</b>	\$	<b>1,408</b>
<b>Monitoring</b>									
Groundwater Sampling and Reporting	48	48	events	\$ 400,000	\$ 750,000	\$	19,200,000	\$	36,000,000
<b>Total Monitoring Cost</b>						\$	<b>19,200,000</b>	\$	<b>36,000,000</b>
<b>Monitoring cost/pound of contaminants</b>						\$	<b>12,800</b>	\$	<b>24,000</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>									
<b>Well abandonment</b>									
USAS	120	120	each	\$ 100	\$ 200	\$	12,000	\$	24,000
LSAS	100	100	each	\$ 250	\$ 500	\$	25,000	\$	50,000
AFG	80	80	each	\$ 500	\$ 1,000	\$	40,000	\$	80,000
<b>Total D&amp;D Cost</b>						\$	<b>77,000</b>	\$	<b>154,000</b>
<b>D&amp;D cost/pound of contaminants</b>						\$	<b>51</b>	\$	<b>103</b>

**TABLE H-4  
GROUNDWATER SITE-WIDE - ENHANCED BIOLOGICAL DEGREDDATION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: <i>In Situ</i> Treatment/Enhanced Biological Degredation - Order of Magnitude Cost Estimate</b>							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
Injection points							
USAS (ZOI: low=20 ft and high=15 ft radii)	6,900	12,000	Each	\$ 1,500	\$ 2,500	\$ 10,350,000	\$ 30,000,000
LSAS	4,200	7,400	Each	\$ 2,500	\$ 5,000	\$ 10,500,000	\$ 37,000,000
AFG and S&P Snads	2,800	5,000	Each	\$ 9,000	\$ 15,000	\$ 25,200,000	\$ 75,000,000
				<b>Total Capital Cost</b>		<b>\$ 46,050,000</b>	<b>\$ 142,000,000</b>
				<b>Capital cost/pound of contaminants</b>		<b>\$ 30,700</b>	<b>\$ 94,667</b>
<b>Operation</b>							
Chemical ( low = 2 injection and high = 4 injection)							
USAS	200,000,000	400,000,000	gallons	0.15	0.30	\$ 30,000,000	\$ 120,000,000
LSAS	60,000,000	120,000,000	gallons	0.15	0.30	\$ 9,000,000	\$ 36,000,000
AFG	12,000,000	24,000,000	gallons	0.15	0.30	\$ 1,800,000	\$ 7,200,000
Injection Labor and Expenses (low = \$375 and high = \$750/injection/injection point)							
USAS	6,900	24,000	inj. point	\$ 375	\$ 750	\$ 2,587,500	\$ 18,000,000
LSAS	4,200	14,800	inj. point	\$ 375	\$ 750	\$ 1,575,000	\$ 11,100,000
AFG and S&P Snads	2,800	10,000	inj. point	\$ 375	\$ 750	\$ 1,050,000	\$ 7,500,000
				<b>Total Operational Cost</b>		<b>\$ 46,012,500</b>	<b>\$ 199,800,000</b>
				<b>Operational cost/pound of contaminants</b>		<b>\$ 30,675</b>	<b>\$ 133,200</b>
<b>Maintenance</b>							
Injection well repair/redevelopment (low = \$100 and high = \$200/injection well)							
	6,900	12,000	each	\$ 100	\$ 200	\$ 690,000	\$ 2,400,000
	4,200	7,400	each	\$ 100	\$ 200	\$ 420,000	\$ 1,480,000
	2,800	5,000	each	\$ 100	\$ 200	\$ 280,000	\$ 1,000,000
				<b>Total Maintenance Cost</b>		<b>\$ 1,390,000</b>	<b>\$ 4,880,000</b>
				<b>Maintenance cost/pound of contaminants</b>		<b>\$ 927</b>	<b>\$ 3,253</b>
<b>Monitoring</b>							
Groundwater Sampling and Reporting (low = 20 and high = 40 events)							
	20	40	events	\$ 400,000	\$ 750,000	\$ 8,000,000	\$ 30,000,000
				<b>Total Monitoring Cost</b>		<b>\$ 8,000,000</b>	<b>\$ 30,000,000</b>
				<b>Monitoring cost/pound of contaminants</b>		<b>\$ 5,333</b>	<b>\$ 20,000</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Well abandonment							
USAS	6,900	12,000	each	\$ 100	\$ 100	\$ 690,000	\$ 1,200,000
LSAS	4,200	7,400	each	\$ 250	\$ 250	\$ 1,050,000	\$ 1,850,000
AFG and S&P Snads	2,800	5,000	each	\$ 500	\$ 500	\$ 1,400,000	\$ 2,500,000
				<b>Total D&amp;D Cost</b>		<b>\$ 3,140,000</b>	<b>\$ 5,550,000</b>
				<b>D&amp;D cost/pound of contaminants</b>		<b>\$ 2,093</b>	<b>\$ 3,700</b>

**TABLE H-5  
GROUNDWATER SITE-WIDE - *IN SITU* CHEMICAL OXIDATION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: <i>In Situ</i> Treatment/<i>In Situ</i> Chemical Oxidation - Order of Magnitude Cost Estimate</b>							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
Injection points							
USAS (ZOI: low=20 ft and high=15 ft radii)	6,900	12,000	Each	\$ 1,500	\$ 2,500	\$ 10,350,000	\$ 30,000,000
LSAS	4,200	7,400	Each	\$ 2,500	\$ 5,000	\$ 10,500,000	\$ 37,000,000
AFG and S&P Snads	2,800	5,000	Each	\$ 9,000	\$ 15,000	\$ 25,200,000	\$ 75,000,000
						<b>Total Capital Cost</b>	<b>\$ 46,050,000 \$ 142,000,000</b>
						<b>Capital cost/pound of contaminants</b>	<b>\$ 30,700 \$ 94,667</b>
<b>Operation</b>							
Chemical (low = 1 injection and high = 2 injection)							
USAS	100,000,000	200,000,000	gallons	\$ 3	\$ 7	\$ 300,000,000	\$ 1,400,000,000
LSAS	30,000,000	60,000,000	gallons	\$ 3	\$ 7	\$ 90,000,000	\$ 420,000,000
AFG	6,000,000	12,000,000	gallons	\$ 3	\$ 7	\$ 18,000,000	\$ 84,000,000
Injection Labor and Expenses (low = \$375 and high = \$750/injection/injection point)							
USAS	6,900	24,000	inj. point	\$ 375	\$ 750	\$ 2,587,500	\$ 18,000,000
LSAS	4,200	14,800	inj. point	\$ 375	\$ 750	\$ 1,575,000	\$ 11,100,000
AFG and S&P Snads	2,800	10,000	inj. point	\$ 375	\$ 750	\$ 1,050,000	\$ 7,500,000
						<b>Total Operational Cost</b>	<b>\$ 413,212,500 \$ 1,940,600,000</b>
						<b>Operational cost/pound of contaminants</b>	<b>\$ 275,475 \$ 1,293,733</b>
<b>Maintenance</b>							
Injection well repair/redevelopment (low = \$0 and high = \$100/injection well)							
	6,900	12,000	each	\$ -	\$ 100	\$ -	\$ 1,200,000
	4,200	7,400	each	\$ -	\$ 100	\$ -	\$ 740,000
	2,800	5,000	each	\$ -	\$ 100	\$ -	\$ 500,000
						<b>Total Maintenance Cost</b>	<b>\$ - \$ 2,440,000</b>
						<b>Maintenance cost/pound of contaminants</b>	<b>\$ - \$ 1,627</b>
<b>Monitoring</b>							
Groundwater Sampling and Reporting (low = 20 and high = 40 events)							
	20	40	events	\$ 400,000	\$ 750,000	\$ 8,000,000	\$ 30,000,000
						<b>Total Monitoring Cost</b>	<b>\$ 8,000,000 \$ 30,000,000</b>
						<b>Monitoring cost/pound of contaminants</b>	<b>\$ 5,333 \$ 20,000</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Well abandonment							
USAS	6,900	12,000	each	\$ 100	\$ 100	\$ 690,000	\$ 1,200,000
LSAS	4,200	7,400	each	\$ 250	\$ 250	\$ 1,050,000	\$ 1,850,000
AFG and S&P Snads	2,800	5,000	each	\$ 500	\$ 500	\$ 1,400,000	\$ 2,500,000
						<b>Total D&amp;D Cost</b>	<b>\$ 3,140,000 \$ 5,550,000</b>
						<b>D&amp;D cost/pound of contaminants</b>	<b>\$ 2,093 \$ 3,700</b>

**TABLE H-6  
GROUNDWATER SITE-WIDE - ELECTRICAL RESISTIVE HEATING COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

GROUNDWATER - Site-Wide: <i>In Situ</i> Treatment/Electrical Resistive Heating - Order of Magnitude Cost Estimate							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
Heating/extraction points							
USAS (ZOI: low=20 ft and high=15 ft radii)	6,900	12,000	Each	\$ 1,500	\$ 2,500	\$ 10,350,000	\$ 30,000,000
LSAS	4,200	7,400	Each	\$ 2,500	\$ 5,000	\$ 10,500,000	\$ 37,000,000
AFG and S&P Sands	2,800	5,000	Each	\$ 9,000	\$ 15,000	\$ 25,200,000	\$ 75,000,000
						<b>Total Capital Cost</b>	<b>\$ 46,050,000</b>
						<b>Capital cost/pound of contaminants</b>	<b>\$ 30,700</b>
						<b>\$</b>	<b>\$ 94,667</b>
<b>Operation</b>							
Electricity demand							
USAS	3,226,667	3,226,667	CY	\$ 40	\$ 80	\$ 129,066,667	\$ 258,133,333
LSAS	1,936,000	1,936,000	CY	\$ 40	\$ 80	\$ 77,440,000	\$ 154,880,000
AFG and S&P Sands	387,200	387,200	CY	\$ 40	\$ 80	\$ 15,488,000	\$ 30,976,000
Recovery system operation and treatment (low = 10 year operation and high = 20 year operation)							
Labor	450,000	1,200,000	year	\$ 10	\$ 20	\$ 4,500,000	\$ 24,000,000
Materials	800,000	3,500,000	year	\$ 10	\$ 20	\$ 8,000,000	\$ 70,000,000
						<b>Total Operational Cost</b>	<b>\$ 234,494,667</b>
						<b>Operational cost/pound of contaminants</b>	<b>\$ 156,330</b>
						<b>\$</b>	<b>\$ 358,660</b>
<b>Maintenance</b>							
Heating and extraction well repair/redevelopment (low = \$1000 and high = \$250)							
Treatment System	13,900	24,400	each	\$ 1,000	\$ 2,500	\$ 13,900,000	\$ 61,000,000
	125,000	250,000	year	\$ 10	\$ 20	\$ 1,250,000	\$ 5,000,000
						<b>Total Maintenance Cost</b>	<b>\$ 15,150,000</b>
						<b>Maintenance cost/pound of contaminants</b>	<b>\$ 10,100</b>
						<b>\$</b>	<b>\$ 44,000</b>
<b>Monitoring</b>							
Groundwater Sampling and Reporting (low = 20 and high = 30 events)							
	20	30	events	\$ 400,000	\$ 750,000	\$ 8,000,000	\$ 22,500,000
						<b>Total Monitoring Cost</b>	<b>\$ 8,000,000</b>
						<b>Monitoring cost/pound of contaminants</b>	<b>\$ 5,333</b>
						<b>\$</b>	<b>\$ 15,000</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Well abandonment							
USAS	6,900	12,000	each	\$ 500	\$ 750	\$ 3,450,000	\$ 9,000,000
LSAS	4,200	7,400	each	\$ 650	\$ 950	\$ 2,730,000	\$ 7,030,000
AFG and S&P Sands	2,800	5,000	each	\$ 750	\$ 1,500	\$ 2,100,000	\$ 7,500,000
Treatment system removal		1	each	\$ 850,000	\$ 1,500,000	\$ 850,000	\$ 1,500,000
						<b>Total D&amp;D Cost</b>	<b>\$ 9,130,000</b>
						<b>D&amp;D cost/pound of contaminants</b>	<b>\$ 6,087</b>
						<b>\$</b>	<b>\$ 16,687</b>

**TABLE H-7  
GROUNDWATER SITE-WIDE - TRENCH EXTRACTION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

GROUNDWATER - Site-Wide: Groundwater Recovery/Trench Extraction - Order of Magnitude Cost Estimate							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
Extraction Trench							
USAS (4 trenches @ ~375 LF/each = 1,500 LF)	1,500	1,500	LF	\$ 750	\$ 1,500	\$ 1,125,000	\$ 2,250,000
<b>Total Capital Cost</b>						<b>\$ 1,125,000</b>	<b>\$ 2,250,000</b>
<b>Capital cost/pound of contaminants</b>						<b>\$ 750</b>	<b>\$ 1,500</b>
<b>Operation</b>							
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)							
USAS (2.5 HP motor operating one year = 40800 kW-hours/pump-year)	70	70	Pump years	\$ 0.07	\$ 0.12	\$ 199,920	\$ 342,720
<b>Total Operational Cost</b>						<b>\$ 199,920</b>	<b>\$ 342,720</b>
<b>Operational cost/pound of contaminants</b>						<b>\$ 133</b>	<b>\$ 228</b>
<b>Maintenance</b>							
Well repair/redevelopment (pig and jet each trench once)							
USAS - Trenches	4	4	each	\$ 17,500	\$ 28,000	\$ 70,000	\$ 112,000
<b>Total Maintenance Cost</b>						<b>\$ 70,000</b>	<b>\$ 112,000</b>
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 47</b>	<b>\$ 75</b>
<b>Monitoring</b>							
GW Sampling and Reporting (4 events/year @ 22 years)	88	88	events	\$ 2,500	\$ 5,000	\$ 220,000	\$ 440,000
<b>Total Monitoring Cost</b>						<b>\$ 220,000</b>	<b>\$ 440,000</b>
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 147</b>	<b>\$ 293</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Trench abandonment	4	4	each	\$ 15,000	\$ 30,000	\$ 60,000	\$ 120,000
<b>Total D&amp;D Cost</b>						<b>\$ 60,000</b>	<b>\$ 120,000</b>
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 40</b>	<b>\$ 80</b>



**TABLE H-8  
GROUNDWATER SITE-WIDE - VERTICAL WELL EXTRACTION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: Groundwater Recovery/Vertical Well Extraction - Order of Magnitude Cost Estimate</b>								
Items	Quantity		Units	Unit Cost		Total cost		
	low	high		low	high	low	high	
<b>Capital - Infrastructure</b>								
Extraction Wells								
USAS	37	37	Each	\$ 4,000	\$ 7,500	\$ 148,000	\$ 277,500	
LSAS	27	27	Each	\$ 9,000	\$ 15,000	\$ 243,000	\$ 405,000	
AF Gravel & S&P Sands	13	13	Each	\$ 20,000	\$ 35,000	\$ 260,000	\$ 455,000	
<b>Total Capital Cost</b>						<b>\$ 651,000</b>	<b>\$ 1,137,500</b>	
<b>Capital cost/pound of contaminants</b>						<b>\$ 434</b>	<b>\$ 758</b>	
<b>Operation</b>								
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)								
USAS (0.5 HP motor operating one year = 8,158 kW-hours/pump- year)	370	370	Pump years	\$ 0.07	\$ 0.12	\$ 211,292	\$ 362,215	
LSAS	932	932	Pump years	\$ 0.07	\$ 0.12	\$ 532,228	\$ 912,391	
AF Gravel & S&P Sands	235	235	Pump years	\$ 0.07	\$ 0.12	\$ 134,199	\$ 230,056	
<b>Total Operational Cost</b>						<b>\$ 877,719</b>	<b>\$ 1,504,662</b>	
<b>Operational cost/pound of contaminants</b>						<b>\$ 585</b>	<b>\$ 1,003</b>	
<b>Maintenance</b>								
Well repair/redevelopment (assume half are replaced)								
USAS	19	19	each	\$ 4,000	\$ 7,500	\$ 76,000	\$ 142,500	
LSAS	14	14	each	\$ 9,000	\$ 15,000	\$ 126,000	\$ 210,000	
AF Gravel & S&P Sands	7	7	each	\$ 20,000	\$ 35,000	\$ 140,000	\$ 245,000	
<b>Total Maintenance Cost</b>						<b>\$ 342,000</b>	<b>\$ 597,500</b>	
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 228</b>	<b>\$ 398</b>	
<b>Monitoring</b>								
USAS (4 events/Pump year)	1,480	1,480	Pump events	\$ 400.00	\$ 800.00	\$ 592,000	\$ 1,184,000	
LSAS	3,728	3,728	Pump events	\$ 400.00	\$ 800.00	\$ 1,491,200	\$ 2,982,400	
AF Gravel & S&P Sands	940	940	Pump events	\$ 400.00	\$ 800.00	\$ 376,000	\$ 752,000	
<b>Total Monitoring Cost</b>						<b>\$ 2,459,200</b>	<b>\$ 4,918,400</b>	
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 1,639</b>	<b>\$ 3,279</b>	
<b>Demolishing/Decommissioning (D&amp;D)</b>								
Well abandonment								
USAS	37	37	each	\$ 1,500	\$ 2,200	\$ 55,500	\$ 81,400	
LSAS	27	27	each	\$ 1,800	\$ 3,800	\$ 48,600	\$ 102,600	
AF Gravel & S&P Sands	13	13	each	\$ 2,500	\$ 5,000	\$ 32,500	\$ 65,000	
<b>Total D&amp;D Cost</b>						<b>\$ 136,600</b>	<b>\$ 249,000</b>	
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 91</b>	<b>\$ 166</b>	

**TABLE H-9  
GROUNDWATER SITE-WIDE - AIR STRIPPING COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: Ex Situ Treatment/Air Stripping - Order of Magnitude Cost Estimate</b>							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
Air stripper and appurtenances	37	37	Each	\$ 4,000	\$ 7,500	\$ 148,000	\$ 277,500
<b>Total Capital Cost</b>						<b>\$ 148,000</b>	<b>\$ 277,500</b>
<b>Capital cost/pound of contaminants</b>						<b>\$ 99</b>	<b>\$ 185</b>
<b>Operation</b>							
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)							
50 HP motor operating one year = 815,900 kW-hours/pump-year	48	48	Pump years	\$ 0.07	\$ 0.12	\$ 2,741,424	\$ 4,699,584
<b>Total Operational Cost</b>						<b>\$ 2,741,424</b>	<b>\$ 4,699,584</b>
<b>Operational cost/pound of contaminants</b>						<b>\$ 1,828</b>	<b>\$ 3,133</b>
<b>Maintenance</b>							
Replace or clean packaging or trays	3	6	each	\$ 10,000	\$ 25,000	\$ 30,000	\$ 150,000
<b>Total Maintenance Cost</b>						<b>\$ 30,000</b>	<b>\$ 150,000</b>
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 20</b>	<b>\$ 100</b>
<b>Monitoring</b>							
Vapor Stream (17 samples first year + quarterly for 47 years)	205	205	Pump events	\$ 1,500.00	\$ 3,000.00	\$ 307,500	\$ 615,000
<b>Total Monitoring Cost</b>						<b>\$ 307,500</b>	<b>\$ 615,000</b>
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 205</b>	<b>\$ 410</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Well abandonment							
Remove air stripper and appurtenances	1	1	each	\$ 15,000	\$ 35,000	\$ 15,000	\$ 35,000
<b>Total D&amp;D Cost</b>						<b>\$ 15,000</b>	<b>\$ 35,000</b>
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 10</b>	<b>\$ 23</b>

**TABLE H-10  
GROUNDWATER SITE-WIDE - LIQUID PHASE GRANULAR ACTIVATED CARBON COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

GROUNDWATER - Site-Wide: <i>Ex Situ</i> Treatment/Liquid Phase Granular Activated Carbon - Order of Magnitude Cost Estimate							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
LPGAC vessels and appurtenances	6	6	Each	\$ 15,000	\$ 25,000	\$ 90,000	\$ 150,000
<b>Total Capital Cost</b>						<b>\$ 90,000</b>	<b>\$ 150,000</b>
<b>Capital cost/pound of contaminants</b>						<b>\$ 60</b>	<b>\$ 100</b>
<b>Operation</b>							
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)							
25 HP motor operating one year = 408,000 kW-hours/pump-year	48	48	Pump years	\$ 0.07	\$ 0.12	\$ 1,370,880	\$ 2,350,080
<b>Total Operational Cost</b>						<b>\$ 1,370,880</b>	<b>\$ 2,350,080</b>
<b>Operational cost/pound of contaminants</b>						<b>\$ 914</b>	<b>\$ 1,567</b>
<b>Maintenance</b>							
Replace vessels and appurtenances once in life cycle	3	6	each	\$ 15,000	\$ 25,000	\$ 45,000	\$ 150,000
<b>Total Maintenance Cost</b>						<b>\$ 45,000</b>	<b>\$ 150,000</b>
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 30</b>	<b>\$ 100</b>
<b>Monitoring</b>							
lead + lag (17 samples first year + quarterly for 47 years)	410	410	Pump events	\$ 500.00	\$ 900.00	\$ 205,000	\$ 369,000
<b>Total Monitoring Cost</b>						<b>\$ 205,000</b>	<b>\$ 369,000</b>
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 137</b>	<b>\$ 246</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Remove LPGAC vessels and appurtenances	1	1	each	\$ 15,000	\$ 35,000	\$ 15,000	\$ 35,000
<b>Total D&amp;D Cost</b>						<b>\$ 15,000</b>	<b>\$ 35,000</b>
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 10</b>	<b>\$ 23</b>

**TABLE H-11  
GROUNDWATER SITE-WIDE - ADVANCED OXIDATION PROCESS COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: Ex Situ Treatment/Advanced Oxidation Process - Order of Magnitude Cost Estimate</b>							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
AOP units and appurtenances	3	3	Each	\$ 650,000	\$ 900,000	\$ 1,950,000	\$ 2,700,000
<b>Total Capital Cost</b>						<b>\$ 1,950,000</b>	<b>\$ 2,700,000</b>
<b>Capital cost/pound of contaminants</b>						<b>\$ 1,300</b>	<b>\$ 1,800</b>
<b>Operation</b>							
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)							
25 HP motor operating one year = 408,000 kW-hours/pump-year	48	48	Pump years	\$ 0.07	\$ 0.12	\$ 1,370,880	\$ 2,350,080
<b>Total Operational Cost</b>						<b>\$ 1,370,880</b>	<b>\$ 2,350,080</b>
<b>Operational cost/pound of contaminants</b>						<b>\$ 914</b>	<b>\$ 1,567</b>
<b>Maintenance</b>							
Replace ballasts and bulbs once every: low = 10 years and high 5 = years	4	9	event	\$ 25,000	\$ 25,000	\$ 100,000	\$ 225,000
clean or replace CRU filters: low = 5 years and high = 10 years	4	9	event	\$ 2,000	\$ 5,000	\$ 8,000	\$ 45,000
<b>Total Maintenance Cost</b>						<b>\$ 108,000</b>	<b>\$ 270,000</b>
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 72</b>	<b>\$ 180</b>
<b>Monitoring</b>							
influent and effluent (17 samples first year + quarterly for 47 years)	410	410	Pump events	\$ 500.00	\$ 900.00	\$ 205,000	\$ 369,000
<b>Total Monitoring Cost</b>						<b>\$ 205,000</b>	<b>\$ 369,000</b>
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 137</b>	<b>\$ 246</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Remove AOP units and appurtenances	1	1	each	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
<b>Total D&amp;D Cost</b>						<b>\$ 5,000</b>	<b>\$ 10,000</b>
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 3</b>	<b>\$ 7</b>

**TABLE H-12  
GROUNDWATER SITE-WIDE - DISCHARGE TO POTW COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Site-Wide: Groundwater Recovery/Direct Discharge to POTW - Order of Magnitude Cost Estimate</b>							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
USAS Extraction Wells	37	37	Each	\$ 4,000	\$ 7,500	\$ 148,000	\$ 277,500
USAS Extraction Trenches (4 trenches @ ~375 LF/each = 1,500 LF)	1,500	1,500	LF	\$ 750	\$ 1,500	\$ 1,125,000	\$ 2,250,000
LSAS Extraction Wells	27	27	Each	\$ 9,000	\$ 15,000	\$ 243,000	\$ 405,000
AF Gravel and S&P Sands Extraction Wells	13	13	Each	\$ 20,000	\$ 35,000	\$ 260,000	\$ 455,000
<b>Total Capital Cost</b>						<b>\$ 1,776,000</b>	<b>\$ 3,387,500</b>
<b>Capital cost/pound of contaminants</b>						<b>\$ 1,184</b>	<b>\$ 2,258</b>
<b>Operation</b>							
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)							
USAS Wells (0.5 HP motor operating one year = 8,158 kW-hours/pump- year)	370	370	Pump years	\$ 0.07	\$ 0.12	\$ 211,292	\$ 362,215
USAS Trenches (2.5 HP motor operating one year = 40800 kW-hours/pump-year)	70	70	Pump years	\$ 0.07	\$ 0.12	\$ 199,920	\$ 342,720
LSAS Wells	932	932	Pump years	\$ 0.07	\$ 0.12	\$ 532,228	\$ 912,391
AFGand S&P Sands Wells	235	235	Pump years	\$ 0.07	\$ 0.12	\$ 134,199	\$ 230,056
<b>Total Operational Cost</b>						<b>\$ 1,077,639</b>	<b>\$ 1,847,382</b>
<b>Operational cost/pound of contaminants</b>						<b>\$ 718</b>	<b>\$ 1,232</b>
<b>Maintenance</b>							
Well repair/redevelopment (assume half are replaced)							
USAS Wells	19	19	each	\$ 4,000	\$ 7,500	\$ 76,000	\$ 142,500
USAS - Trenches	4	4	each	\$ 17,500	\$ 28,000	\$ 70,000	\$ 112,000
LSAS Wells	14	14	each	\$ 9,000	\$ 15,000	\$ 126,000	\$ 210,000
AF Gravel & S&P Sands Wells	7	7	each	\$ 20,000	\$ 35,000	\$ 140,000	\$ 245,000
<b>Total Maintenance Cost</b>						<b>\$ 412,000</b>	<b>\$ 709,500</b>
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 275</b>	<b>\$ 473</b>
<b>Monitoring</b>							
USAS (4 events/Pump year)	1,568	1,568	Pump events	\$ 400.00	\$ 800.00	\$ 627,200	\$ 1,254,400
LSAS	3,728	3,728	Pump events	\$ 400.00	\$ 800.00	\$ 1,491,200	\$ 2,982,400
AFG	940	940	Pump events	\$ 400.00	\$ 800.00	\$ 376,000	\$ 752,000
<b>Total Monitoring Cost</b>						<b>\$ 2,494,400</b>	<b>\$ 4,988,800</b>
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 1,663</b>	<b>\$ 3,326</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Well/Trench abandonment							
USAS Wells	37	37	each	\$ 1,500	\$ 2,200	\$ 55,500	\$ 81,400
Trench abandonment	4	4	each	\$ 15,000	\$ 30,000	\$ 60,000	\$ 120,000
LSAS Wells	27	27	each	\$ 1,800	\$ 3,800	\$ 48,600	\$ 102,600
AFG and S&P Sands Wells	13	13	each	\$ 2,500	\$ 5,000	\$ 32,500	\$ 65,000
<b>Total D&amp;D Cost</b>						<b>\$ 196,600</b>	<b>\$ 369,000</b>
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 131</b>	<b>\$ 246</b>

**TABLE H-13  
GROUNDWATER HOT SPOTS - ENHANCED BIOLOGICAL DEGRADATION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Hot Spots: <i>In Situ</i> Treatment/Enhanced Biological Degredation - Order of Magnitude Cost Estimate</b>								
Items	Quantity		Units	Unit Cost		Total cost		
	low	high		low	high	low	high	
<b>Capital - Infrastructure</b>								
Injection points								
USAS	13	13	Each	\$ 1,500	\$ 2,500	\$ 19,500	\$ 32,500	
<b>Total Capital Cost</b>						<b>\$ 19,500</b>	<b>\$ 32,500</b>	
<b>Capital cost/pound of contaminants</b>						<b>\$ 650</b>	<b>\$ 1,083</b>	
<b>Operation</b>								
Chemical (5 injections)								
13 injection Wells (low = 3600 and high = 7300 gallons/injection point/injection)	234,000	474,500	gallons	0.15	0.30	\$ 35,100	\$ 142,350	
Injection Labor and Expenses (2 people, 4 to 8 days/injection)								
13 wells x 5 injections each	65	65	inj. point	\$ 1,000	\$ 2,500	\$ 65,000	\$ 162,500	
<b>Total Operational Cost</b>						<b>\$ 100,100</b>	<b>\$ 304,850</b>	
<b>Operational cost/pound of contaminants</b>						<b>\$ 3,337</b>	<b>\$ 10,162</b>	
<b>Maintenance</b>								
Injection well repair/redevelopment (replaced once per life cycle)								
	13	13	each	\$ 1,500	\$ 2,500	\$ 19,500	\$ 32,500	
<b>Total Maintenance Cost</b>						<b>\$ 19,500</b>	<b>\$ 32,500</b>	
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 650</b>	<b>\$ 1,083</b>	
<b>Monitoring</b>								
Groundwater Sampling and Reporting (injection + monitoring wells = 30 wells)								
	20	30	events	\$ 35,000	\$ 45,000	\$ 700,000	\$ 1,350,000	
<b>Total Monitoring Cost</b>						<b>\$ 700,000</b>	<b>\$ 1,350,000</b>	
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 23,333</b>	<b>\$ 45,000</b>	
<b>Demolishing/Decommissioning (D&amp;D)</b>								
Well abandonment								
	13	13	each	\$ 750	\$ 1,100	\$ 9,750	\$ 14,300	
<b>Total D&amp;D Cost</b>						<b>\$ 9,750</b>	<b>\$ 14,300</b>	
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 325</b>	<b>\$ 477</b>	

**TABLE H-14  
GROUNDWATER HOT SPOTS - *IN SITU* CHEMICAL OXIDATION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Hot Spots: <i>In Situ</i> Treatment/<i>In Situ</i> Chemical Oxidation - Order of Magnitude Cost Estimate</b>								
Items	Quantity		Units	Unit Cost		Total cost		
	low	high		low	high	low	high	
<b>Capital - Infrastructure</b>								
Injection Wells	13	13	Each	\$ 1,500	\$ 2,500	\$ 19,500	\$ 32,500	
<b>Total Capital Cost</b>						<b>\$ 19,500</b>	<b>\$ 32,500</b>	
<b>Capital cost/pound of contaminants</b>						<b>\$ 650</b>	<b>\$ 1,083</b>	
<b>Operation</b>								
<b>Chemical</b>								
13 injection Wells @ (low = 3600 and high = 7300 gallons/injection well) x 3 injections	140,400	284,700	gallons	\$ 3.00	\$ 5.00	\$ 421,200	\$ 1,423,500	
Injection Labor and Expenses (2 people, 4 to 8 days/injection)								
13 wells x 3 injections each	39	39	inj. point	\$ 1,000	\$ 2,500	\$ 39,000	\$ 97,500	
<b>Total Operational Cost</b>						<b>\$ 460,200</b>	<b>\$ 1,521,000</b>	
<b>Operational cost/pound of contaminants</b>						<b>\$ 15,340</b>	<b>\$ 50,700</b>	
<b>Maintenance</b>								
Injection well repair/redevelopment (replaced once per life cycle)	13	13	each	\$ 1,500	\$ 2,500	\$ 19,500	\$ 32,500	
<b>Total Maintenance Cost</b>						<b>\$ 19,500</b>	<b>\$ 32,500</b>	
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 650</b>	<b>\$ 1,083</b>	
<b>Monitoring</b>								
Groundwater Sampling and Reporting (30 wells @ low = 20 and high = 40 events)	20	30	events	\$ 35,000	\$ 45,000	\$ 700,000	\$ 1,350,000	
<b>Total Monitoring Cost</b>						<b>\$ 700,000</b>	<b>\$ 1,350,000</b>	
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 23,333</b>	<b>\$ 45,000</b>	
<b>Demolishing/Decommissioning (D&amp;D)</b>								
Well abandonment	13	13	each	\$ 750	\$ 1,100	\$ 9,750	\$ 14,300	
<b>Total D&amp;D Cost</b>						<b>\$ 9,750</b>	<b>\$ 14,300</b>	
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 325</b>	<b>\$ 477</b>	

**TABLE H-15  
GROUNDWATER HOT SPOTS - ELECTRICAL RESISTIVE HEATING COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Hot Spots: <i>In Situ</i> Treatment/Electrical Resistive Heating - Order of Magnitude Cost Estimate</b>							
Items	Quantity		Units	Unit Cost		Total cost	
	low	high		low	high	low	high
<b>Capital - Infrastructure</b>							
Heating/extraction points	28	28	Each	\$ 3,000	\$ 5,000	\$ 84,000	\$ 140,000
Treatment System (boiler and vapor recovery and treatment)						\$ -	\$ -
<b>Total Capital Cost</b>						<b>\$ 84,000</b>	<b>\$ 140,000</b>
<b>Capital cost/pound of contaminants</b>						<b>\$ 2,800</b>	<b>\$ 4,667</b>
<b>Operation</b>							
Electricity demand (energy requirement to heat subsurface and treat emission)	8,800	20,000	CY	\$ 40	\$ 80	\$ 352,000	\$ 1,600,000
Recovery system operation and treatment (low = 5 year operation and high = 10 year operation)							
Labor	5	10	year	\$ 250,000	\$ 375,000	\$ 1,250,000	\$ 3,750,000
Materials	5	10	year	\$ 25,000	\$ 35,000	\$ 125,000	\$ 350,000
<b>Total Operational Cost</b>						<b>\$ 1,727,000</b>	<b>\$ 5,700,000</b>
<b>Operational cost/pound of contaminants</b>						<b>\$ 57,567</b>	<b>\$ 190,000</b>
<b>Maintenance</b>							
Heating point repairs/redevelopment (replace once per life cycle)	28	28	each	\$ 3,000	\$ 5,000	\$ 84,000	\$ 140,000
Treatment System	5	10	year	\$ 15,000	\$ 45,000	\$ 75,000	\$ 450,000
<b>Total Maintenance Cost</b>						<b>\$ 159,000</b>	<b>\$ 590,000</b>
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 5,300</b>	<b>\$ 19,667</b>
<b>Monitoring</b>							
Groundwater Sampling and Reporting (low = 20 and high = 30 events)	20	40	events	\$ 35,000	\$ 45,000	\$ 700,000	\$ 1,800,000
<b>Total Monitoring Cost</b>						<b>\$ 700,000</b>	<b>\$ 1,800,000</b>
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 23,333</b>	<b>\$ 60,000</b>
<b>Demolishing/Decommissioning (D&amp;D)</b>							
Well Abandonment	28	28	each	\$ 750	\$ 1,100	\$ 21,000	\$ 30,800
Treatment system removal		1	each	\$ 12,000	\$ 25,000	\$ 12,000	\$ 25,000
<b>Total D&amp;D Cost</b>						<b>\$ 33,000</b>	<b>\$ 55,800</b>
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 1,100</b>	<b>\$ 1,860</b>



**TABLE H-16  
GROUNDWATER HOT SPOTS - FOCUSED GROUNDWATER EXTRACTION AND INJECTION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Hot Spots: Groundwater Recovery/Focused Groundwater Extraction and Injection - Order of Magnitude Cost Estimate</b>								
Items	Quantity		Units	Unit Cost		Total cost		
	low	high		low	high	low	high	
<b>Capital - Infrastructure</b>								
Extraction wells	13	13	Each	\$ 4,000	\$ 7,500	\$ 52,000	\$ 97,500	
Injection wells	5	5	Each	\$ 4,000	\$ 7,500	\$ 20,000	\$ 37,500	
<b>Total Capital Cost</b>						<b>\$ 72,000</b>	<b>\$ 135,000</b>	
<b>Capital cost/pound of contaminants</b>						<b>\$ 2,400</b>	<b>\$ 4,500</b>	
<b>Operation</b>								
Utility Cost (low = \$0.07 and high = \$0.12/kW-hr)								
USAS (0.5 HP motor operating one year = 8,158 kW-hours/pump- year)	201	201	Pump years	\$ 0.07	\$ 0.12	\$ 114,783	\$ 196,771	
<b>Total Operational Cost</b>						<b>\$ 114,783</b>	<b>\$ 196,771</b>	
<b>Operational cost/pound of contaminants</b>						<b>\$ 3,826</b>	<b>\$ 6,559</b>	
<b>Maintenance</b>								
Well repair/redevelopment (assume half are replaced during life cycle)								
USAS Extraction wells	13	13	each	\$ 4,000	\$ 7,500	\$ 52,000	\$ 97,500	
USAS Injection wells	5	5	each	\$ 4,000	\$ 7,500	\$ 20,000	\$ 37,500	
<b>Total Maintenance Cost</b>						<b>\$ 72,000</b>	<b>\$ 135,000</b>	
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 2,400</b>	<b>\$ 4,500</b>	
<b>Monitoring</b>								
4 events/year	20	30	events	\$ 35,000	\$ 45,000	\$ 700,000	\$ 1,350,000	
<b>Total Monitoring Cost</b>						<b>\$ 700,000</b>	<b>\$ 1,350,000</b>	
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 23,333</b>	<b>\$ 45,000</b>	
<b>Demolishing/Decommissioning (D&amp;D)</b>								
Well abandonment								
Extraction wells	13	13	each	\$ 1,500	\$ 2,200	\$ 19,500	\$ 28,600	
Injection wells	5	5	each	\$ 1,800	\$ 3,800	\$ 9,000	\$ 19,000	
<b>Total D&amp;D Cost</b>						<b>\$ 28,500</b>	<b>\$ 47,600</b>	
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 950</b>	<b>\$ 1,587</b>	

**TABLE H-17  
GROUNDWATER HOT SPOTS - DUAL-PHASE EXTRACTION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Hot Spots: Groundwater Recovery/Dual Phase Extraction - Order of Magnitude Cost Estimate</b>								
Items	Quantity		Units	Unit Cost		Total cost		
	low	high		low	high	low	high	
<b>Capital - Infrastructure</b>								
DPE extraction points	28	28	Each	\$ 2,200	\$ 4,500	\$ 61,600	\$ 126,000	
Treatment system and appurtenances	1	1	Each	\$ 35,000	\$ 55,000	\$ 35,000	\$ 55,000	
<b>Total Capital Cost</b>						<b>\$ 96,600</b>	<b>\$ 181,000</b>	
<b>Capital cost/pound of contaminants</b>						<b>\$ 3,220</b>	<b>\$ 6,033</b>	
<b>Operation</b>								
Electricity demand								
15 HP motor operating one year = 244,800 kW-hours/pump-year	5	10	pump year	\$ 0.07	\$ 0.12	\$ 85,680	\$ 293,760	
VPGAC			pounds			\$ -	\$ -	
Recovery system operation and treatment (low = 10 year operation and high = 20 year operation)								
Labor	5	10	year	\$ 250,000	\$ 375,000	\$ 1,250,000	\$ 3,750,000	
Materials	5	10	year	\$ 25,000	\$ 35,000	\$ 125,000	\$ 350,000	
<b>Total Operational Cost</b>						<b>\$ 1,460,680</b>	<b>\$ 4,393,760</b>	
<b>Operational cost/pound of contaminants</b>						<b>\$ 48,689</b>	<b>\$ 146,459</b>	
<b>Maintenance</b>								
DPE well point repairs/redevelopment (replace once per life cyclee)	28	28	each	\$ 2,200	\$ 4,500	\$ 61,600	\$ 126,000	
Treatment System	5	10	year	\$ 15,000	\$ 25,000	\$ 75,000	\$ 250,000	
<b>Total Maintenance Cost</b>						<b>\$ 136,600</b>	<b>\$ 376,000</b>	
<b>Maintenance cost/pound of contaminants</b>						<b>\$ 4,553</b>	<b>\$ 12,533</b>	
<b>Monitoring</b>								
Groundwater Sampling and Reporting (low = 20 and high = 30 events)	20	30	events	\$ 35,000	\$ 45,000	\$ 700,000	\$ 1,350,000	
<b>Total Monitoring Cost</b>						<b>\$ 700,000</b>	<b>\$ 1,350,000</b>	
<b>Monitoring cost/pound of contaminants</b>						<b>\$ 23,333</b>	<b>\$ 45,000</b>	
<b>Demolishing/Decommissioning (D&amp;D)</b>								
Well abandonment	28	28	each	\$ 500	\$ 750	\$ 14,000	\$ 21,000	
Treatment system removal		1	each	\$ 12,000	\$ 25,000	\$ 12,000	\$ 25,000	
<b>Total D&amp;D Cost</b>						<b>\$ 26,000</b>	<b>\$ 46,000</b>	
<b>D&amp;D cost/pound of contaminants</b>						<b>\$ 867</b>	<b>\$ 1,533</b>	

**TABLE H-18  
GROUNDWATER HOT SPOTS - EXCAVATION COST ESTIMATE**

**REMEDIAL ACTION PLAN ADDENDUM  
LOCKHEED MARTIN TALLEVAST SITE  
TALLEVAST, FLORIDA**

<b>GROUNDWATER - Hot Spots: Removal/Excavation - Order of Magnitude Cost Estimate</b>								
Items	Quantity		Units	Unit Cost		Total cost		
	low	high		low	high	low	high	
<b>Capital</b>								
Excavation	6,000	8,800	CY	\$ 45	\$ 85	\$ 270,000	\$ 748,000	
Handling, Transport and Dispose	8,067	14,520	CY	\$ 20	\$ 65	\$ 161,333	\$ 943,800	
Backfill and regrade	8,067	14,520	CY	\$ 10	\$ 25	\$ 80,667	\$ 363,000	
Sampling - characterization	15	25	sample	\$ 750	\$ 1,500	\$ 11,250	\$ 37,500	
				<b>Total Capital Cost</b>		<b>\$ 512,000</b>	<b>\$ 2,054,800</b>	
				<b>Capital cost/pound of contaminants</b>		<b>\$ 17,067</b>	<b>\$ 68,493</b>	
<b>Operation - none</b>								
				<b>Total Operational Cost</b>		<b>\$ -</b>	<b>\$ -</b>	
				<b>Operational cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>	
<b>Maintenance - none</b>								
				<b>Total Maintenance Cost</b>		<b>\$ -</b>	<b>\$ -</b>	
				<b>Maintenance cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>	
<b>Monitoring</b>								
Groundwater Sampling and Reporting	20	30	events	\$ 35,000	\$ 45,000	\$ 700,000	\$ 1,350,000	
				<b>Total Monitoring Cost</b>		<b>\$ 700,000</b>	<b>\$ 1,350,000</b>	
				<b>Monitoring cost/pound of contaminants</b>		<b>\$ 23,333</b>	<b>\$ 45,000</b>	
<b>Demolishing/Decommissioning (D&amp;D) - none</b>								
				<b>Total D&amp;D Cost</b>		<b>\$ -</b>	<b>\$ -</b>	
				<b>D&amp;D cost/pound of contaminants</b>		<b>\$ -</b>	<b>\$ -</b>	