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**Appendix A3**  
**Detailed Calculations**

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# SCENARIO 1: IMPLEMENTATION, ENFORCEMENT AND MONITORING OF WORKERS HEALTH AND SAFETY AND SPILL PREVENTION MEASURES

Item	Description	Quantification	Value	Timing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
<b>1 Raise awareness</b>																								
1.1	Organize workshops with local population	· # and frequency of workshops	2 during year 1 1 / year in the next 3 years	Recurring	4,000	2,000	2,000	2,000																
1.2	Produce and diffuse awareness raising material	· # of risk awareness kits produced	250	Initial	2,500																			
<b>2 Develop a Health and Safety / Spill Prevention Plan</b>																								
2.1	Consultation and working session	· Duration of consultation · # of people consulted	0.5 20	Initial	3,250																			
2.2	Development of initial plan	· # of international consultants days · # of national consultants days	10 40	Initial	22,000																			
2.3	Plan revisions	Frequency of revisions · # of national consultants days	1 5	Recurring		1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
<b>3 Train the personnel</b>																								
3.1	Initial training	· # of people to be trained · Employee turnover · Duration of initial training (days)	20 4% 2	Recurring	1,600	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640	640
3.2	Training updates	· # of people to be trained · Frequency of training updates (/year) · Duration of training updates (days)	20 1 0.5	Recurring		400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
<b>4 Implement the Health and Safety Plan</b>																								
4.1	Provide personal protection equipment	· # of kits · Percentage of kits to be replaced (yearly)	12 5%	Initial + recurring	1,800	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
4.2	Label hazardous materials and contaminated areas	· # of items to be labeled · Additional items to be labeled yearly	75 5	Initial Recurring	375	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
4.3	Test transformers before handling	· # of tests (CLOR N OIL)	10	Recurring	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Item	Description	Quantification	Value	Timing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	
4.4	Implement Health and Safety procedures	· # of employees at the site	5																						
		· average time dedicated to procedures by employees at the workshop (% of workday)	5%	Recurring	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
		· # of other employees on site	15																						
		· average time dedicated to procedures by other employees on the site (% of workday)	1%																						
4.5	Implement spill response procedures	· # of spills / months	1	Recurring	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
		· Average time dedicated to clean up (days)	1																						
<b>5 Monitoring</b>																									
5.1	Monitoring of the health and safety plan implementation	· Average time (in days) dedicated each month to monitoring by the Health and safety specialist	1	Recurring		3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	
5.2	Environmental monitoring - Soil testing	· # of tests	10	Recurring		150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	
5.3	Blood testing	· # of sampling	15	Recurring					15,000					15,000										15,000	
<b>6</b>	<b>Contingency, Technical Support, F</b>	<b>· % of overhead</b>	<b>10%</b>	Recurring	3,833	1,121	1,121	1,121	2,421	921	921	921	921	2,421	921	921	921	921	921	921	921	921	921	2,421	

<b>TOTAL</b>	<b>42,158</b>	<b>12,326</b>	<b>12,326</b>	<b>12,326</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>
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PV (Costs) \$191,675

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Benefit stream	0	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653	16,653
PV (Benefits)	\$191,675																			
Stream of benefits - costs	-42,158	4,328	4,328	4,328	-9,972	6,528	6,528	6,528	6,528	-9,972	6,528	6,528	6,528	6,528	6,528	6,528	6,528	6,528	6,528	-9,972
<b>NPV</b>	<b>0</b>																			
<b>DALYs needed/an</b>	<b>0.8</b>																			
<i>IRR (test)</i>	5%																			

Number of DALY /100000hab total	20,508
Population on site	733
Total number of DALYs on site	150
Minimum required effect of site reclamation on total health	<b>0.5%</b>

# SCENARIO 2 : CONTAINMENT OF EXISTING CONTAMINATION

Item	Description	Quantification	Value	Timing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
<b>1</b>	<b>Implementation, enforcement and monitoring of workers health and safety and spill prevention measures</b>	<b>Measures described in Scenario 1</b>	<b>TOTAL</b>		<b>42,158</b>	<b>12,326</b>	<b>12,326</b>	<b>12,326</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>
<b>2</b>	<b>Design of containment plan</b>																							
2.1	Develop a detailed containment plan	· # of international consultant days	30	Initial	30,000																			
2.2	Conduct test based inventory of PCBs contaminated transformers and oil	· # of tests (CLOR N OIL)	5	Initial	50																			
2.3	Conduct detailed soil analysis	· # of tests (CALUX)	30	Initial	12,000																			
<b>3</b>	<b>Provide secured containment infrastructure and equipment</b>																							
3.1	Provide secured drums	· # of drums required initially · # of additional drums required yearly	7 14	Initial Recurring	688	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376
3.2	Build a secured containment facility	· Unit		Initial	100,000																			
3.3	Move and store PCB contaminated equipment and oil in containment facility	· Unit		Initial	5,000																			
3.4	Cap and pave the most contaminated areas that are not paved yet (storage area)	· Extent of the area requiring capping (m2)	4400	Initial	220,000																			
3.5	Improve drainage and sediment control system on the site	· Unit		Initial	25,000																			
<b>4</b>	<b>Monitor and maintain containment infrastructure</b>																							
4.1	Monitoring and maintenance of contaminated transformers and oil containment measures	· % of capital costs	5%	Recurring		5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284	5,284
4.2	Conduct soil/sediment analysis	· Number of analysis	3	Recurring		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
4.3	Pavements and drainage system maintenance	· % of capital costs	1%	Recurring		2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450
<b>5</b>	<b>Contingency, Technical Support, P</b>	· % of overhead	<b>10%</b>	Recurring	39,274	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031
		<b>TOTAL</b>			<b>474,169</b>	<b>23,667</b>	<b>23,667</b>	<b>23,667</b>	<b>37,967</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>37,967</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>21,467</b>	<b>37,967</b>

Item	Description	Quantification	Value	Timing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
		PV (Costs)	\$733,650																					
		Benefit stream			0	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741	63,741
		PV (Benefits)	\$733,650																					
		Stream of benefits - costs			-474,169	40,074	40,074	40,074	25,774	42,274	42,274	42,274	42,274	25,774	42,274	42,274	42,274	42,274	42,274	42,274	42,274	42,274	42,274	25,774
		NPV	0																					
		DALYs needed/an	3.1																					
		IRR (test)	5%																					

Number of DALY /100000hab total	20,508
Population on site	733
Total number of DALYs on site	150
Minimum required effect of site reclamation on total health	2.1%

# SCENARIO 3: DISPOSAL OF EXISTING CONTAMINATION

Item	Description	Quantification	Value	Timing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
<b>1</b>	<b>Implementation, enforcement and monitoring of workers health and safety and spill prevention measures</b>	<b>Measures described in Scenario 1</b>	<b>TOTAL</b>		<b>42,158</b>	<b>12,326</b>	<b>12,326</b>	<b>12,326</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>
<b>2</b>	<b>Design of disposal plan</b>																							
2.1	Develop a disposal plan	• # of international consultant days	30	Initial	30,000																			
2.2	Conduct test based inventory of PCBs contaminated transformers and oil	• # of tests (CLOR N OIL)	5	Initial	50																			
2.3	Conduct detailed soil analysis	• # of tests (CALUX)	30	Initial	12,000																			
<b>3</b>	<b>Implementation of disposal</b>																							
3.1	Disposal of contaminated transformers	• Quantity of transformer (tons)	2	Initial	4,092																			
3.2	Disposal of contaminated oil	• Quantity of oil (tons)	2	Initial	5,803																			
3.3	Disposal of contaminated soil from the open-air storage area	• Quantity of contaminated soil (tons)	176	Initial	260,480																			
3.4	Disposal of contaminated soil from the road	• Quantity of contaminated soil (tons)	32	Initial	47,360																			
3.5	Packaging and shipping	• % of overhead	25%	Initial	79,434																			
<b>4</b>	<b>Contingency, Technical Support, F</b>	<b>• % of overhead</b>	<b>10%</b>	<b>Initial</b>	<b>43,922</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
		<b>TOTAL</b>			<b>525,298</b>	<b>12,326</b>	<b>12,326</b>	<b>12,326</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>10,126</b>	<b>26,626</b>

Item	Description	Quantification	Value	Timing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
		PV (Costs)	\$651,809																					
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
		Benefit stream			0	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631	56,631
		PV (Benefits)	\$651,809																					
		Stream of benefits - costs			-525,298	44,305	44,305	44,305	30,005	46,505	46,505	46,505	46,505	30,005	46,505	46,505	46,505	46,505	46,505	46,505	46,505	46,505	46,505	30,005
		NPV	0																					
		DALYs needed/an	2.8																					
		IRR (test)	5%																					

Number of DALY /100000hab total	20,508
Population on site	733
Total number of DALYs on site	150
Minimum required effect of site reclamation on total health	1.8%