Treatment option 2 (LOW Cost WIPP)-8Acre

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

Other Project Cost (OPC)		min	mean	max	expected value	Total Cost
OPC						
Conceptual Design, Project Mgt, & Permitting		29,135	45,031	60,926	45,031	45,031
Testing and Start-up		11,321	17,497	23,674	17,497	17,497
Total OPC (unescalated)			62,528			62,528
plus escalation of			5,919			5,919
plus contingency of			49,414			49,414
Total OPC including escalation, mgt reserve, & contingency						117,860
TEC						-
ESH&Q		11,855	18,324	24,792	18,324	18,339
Project mgt		8,278	12,794	17,310	12,794	12,804
Construction, Equip, G&A & Procurement		108,084	167,054	226,024	167,054	167,191
Total TEC (unescalated)			198,171			198,334
plus escalation of			20,200			20,217
plus contingency of			127,011			127,115
Total TEC including escalation, mgt reserve, contingency						345,666
						-
Total Project Cost (TPC)						-
TPC unescalated			260,699			260,861
plus escalation of			26,119			26,135
plus contingency of			176,425			176,529
Total TPC including esc, mgt res, contingency		$	463,243			463,526
discount factor @ OMB discount rate of		4.20%				
Discounted Annual Cost						383,483
						-
Operations	2080 hr-shil	min	mean	max	expected value	-
Tangible Costs						2,566,305
Managerial		1,747	2,184	2,730	2,220	60,781
Supervision		11,232	14,040	17,550	14,274	390,737
Labor (Production)		17,114	21,393	26,741	21,749	595,367
(Maintenance)		6,206	6,895	9,998	7,297	576,468
Maintenance of Equipment		10,924	12,138	17,600	12,846	352,359
Propene		87	109	137	111	3,043
Grout		582	728	910	740	20,260
Consumables		7,163	8,954	11,192	9,103	249,181
Utilities(Power&Water)		1,519	1,899	2,374	1,931	52,847
STEAM		8	10	13	10	278
Disposal (m3)	2,696.7	456	570	712	579	15,861
Analytical		384	480	600	488	13,359
Disposal (m3)	3545	23,190	28,987	36,234	29,471	235,765
Operations subtotal						2,566,305
plus Operations Contingency @		5.0%	15.0%	45.0%	22%	556,033
Total Operations (w/contingency						3,122,337
discount factor @ OMB discount rate of		4.20%				
Discounted Annual Cost						1,633,358
		min	mean	max	expected value	-
Post Operations						-
Decommission		6,257	7,821	9,776	7,951	7,951
Decontamination/surveillance		10,428	13,035	16,294	13,252	13,252
Demolition		20,856	26,070	32,587	26,504	26,504
Post-Operations Subtotal		37,541	46,926	58,657	47,708	47,708
plus Escalation						47,084
plus Post-Operations Contingency @		15%	40%	58%	38%	35,705
Total Post-Operations (w/ escalation & contingency)						130,497
discount factor @ OMB discount rate of		4.20%				
Discounted Annual Cost						46,926
						-
Total Cost						2,874,874
Cumulative Total LCC						-
Total Cost (w/mgt reserve, & contingency)						3,716,361
Cumulative Total LCC						-
discount factor @ OMB discount rate of		4.20%				
Discounted Annual Cost						
Cumulative Discounted LCC						2,063,766

	2003	2004	2005	2006	2007	2008	2009	2010	2011
	0	1	2	3	4	5	6	7	8
	1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247
	Concept Design		Prelim Design	Final Design		Construction		Start-up	
	10/1/03 -4/30/04		9/30/04-8/31/05	9/01/05-09/30/06		10/01/06-01/31/10		02/01/10-08/31/11	
Conceptual Design, Project Mgt, & Permitting	1,422	8,472	18,251	16,886					
Testing and Start-up							-	4,374	13,123
Total OPC (unescalated)	1,422	8,472	18,251	16,886	-	-	-	4,374	13,123
plus escalation of	135	802	1,728	1,598	-	-	-	414	1,242
plus contingency of	1,123	6,695	14,423	13,345	-	-	-	3,457	10,371
Total OPC including escalation, mgt reserve, & contingency	$ 2,679	$ 15,969	$ 34,401	$ 31,830	$ -	$ -	$ -	$ 8,245	$ 24,736
ESH&Q				1,652	5,006	5,006	5,006	1,667	
Project mgt				1,154	3,496	3,496	3,496	1,164	
Construction, Equip, G&A & Procurement				15,062	45,643	45,643	45,643	15,199	
Total TEC (unescalated)			-	17,868	54,145	54,145	54,145	18,030	-
plus escalation of			-	1,821	5,519	5,519	5,519	1,838	-
plus contingency of			-	11,452	34,703	34,703	34,703	11,556	-
Total TEC including escalation, mgt reserve, contingency	$ -	$ -	$ -	$ 31,141	$ 94,367	$ 94,367	$ 94,367	$ 31,424	$ -
TPC unescalated	1,422	8,472	18,251	34,754	54,145	54,145	54,145	22,405	13,123
plus escalation of	135	802	1,728	3,420	5,519	5,519	5,519	2,252	1,242
plus contingency of	1,123	6,695	14,423	24,797	34,703	34,703	34,703	15,013	10,371
Total TPC including esc, mgt res, contingency	$ 2,679	$ 15,969	$ 34,401	$ 62,971	$ 94,367	$ 94,367	$ 94,367	$ 39,669	$ 24,736
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost	$ 2,679	$ 15,325	$ 31,684	$ 55,659	$ 80,048	$ 76,821	$ 73,725	$ 29,743	$ 17,798
Tangible Costs	-	-	-	-	-	-	-	73,231	110,475
Managerial								2,244	2,769
Supervision								14,426	17,803
Labor (Production)								21,981	27,126
(Maintenance)								7,782	26,904
Maintenance of Equipment								13,698	16,022
Propene								112	139
Grout								748	923
Consumables								9,200	11,353
Utilities(Power&Water)								1,951	2,408
STEAM								10	13
Disposal (m3)								586	723
Analytical								493	609
Disposal (m3)									3,684
Operations subtotal	-	-	-	-	-	-	-	73,231	110,475
plus Operations Contingency @	-	-	-	-	-	-	-	15,867	23,936
Total Operations (w/contingency	-	-	-	-	-	-	-	89,097	134,411
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 66,802	$ 96,715
Post-Operations Subtotal	-	-	-	-	-	-	-	-	-
plus Escalation	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost	1,422	8,472	18,251	34,754	54,145	54,145	54,145	95,635	123,598
Cumulative Total LCC	1,422	9,893	28,144	62,899	117,044	171,189	225,334	320,969	444,567
Total Cost (w/mgt reserve, & contingency)	2,679	15,969	34,401	62,971	94,367	94,367	94,367	128,767	159,147
Cumulative Total LCC	2,679	18,648	53,050	116,021	210,388	304,754	399,121	527,888	687,035
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost	2,679	15,325	31,684	55,659	80,048	76,821	73,725	96,545	114,513
Cumulative Discounted LCC	$ 2,679	$ 18,005	$ 49,689	$ 105,348	$ 185,396	$ 262,217	$ 335,942	$ 432,486	$ 547,000

	2012	2013	2014	2015	2016	2017	2018	2019	2020
	9	10	11	12	13	14	15	16	17
	1.282	1.318	1.355	1.393	1.432	1.472	1.513	1.556	1.599
	Operations								Operations
	09/01/11-08/31/13								09/01/11-08/31/27
Total OPC (unescalated)	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-
Total OPC including escalation, mgt reserve, & contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total TEC (unescalated)	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-
Total TEC including escalation, mgt reserve, contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TPC unescalated	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-
Total TPC including esc, mgt res, contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tangible Costs	124,517	127,590	130,750	133,999	137,338	140,771	144,300	147,928	151,657
Managerial	2,847	2,927	3,009	3,093	3,179	3,268	3,360	3,454	3,551
Supervision	18,301	18,814	19,341	19,882	20,439	21,011	21,599	22,204	22,826
Labor (Production)	27,886	28,667	29,469	30,294	31,143	32,015	32,911	33,833	34,780
(Maintenance)	27,657	28,432	29,228	30,046	30,887	31,752	32,641	33,555	34,495
Maintenance of Equipment	16,470	16,931	17,406	17,893	18,394	18,909	19,438	19,983	20,542
Propene	143	147	151	155	159	164	168	173	178
Grout	949	976	1,003	1,031	1,060	1,089	1,120	1,151	1,184
Consumables	11,671	11,998	12,334	12,679	13,034	13,399	13,774	14,160	14,557
Utilities(Power&Water)	2,475	2,545	2,616	2,689	2,764	2,842	2,921	3,003	3,087
STEAM	13	13	14	14	15	15	15	16	16
Disposal (m3)	743	764	785	807	830	853	877	901	927
Analytical	626	643	661	680	699	718	738	759	780
Disposal (m3)	14,735	14,735	14,735	14,735	14,735	14,735	14,735	14,735	14,735
Operations subtotal	124,517	127,590	130,750	133,999	137,338	140,771	144,300	147,928	151,657
plus Operations Contingency @	26,979	27,645	28,329	29,033	29,757	30,500	31,265	32,051	32,859
Total Operations (w/contingency	151,495	155,235	159,080	163,032	167,095	171,271	175,565	179,979	184,516
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013
Discounted Annual Cost	$ 104,614	$ 102,876	$ 101,174	$ 99,508	$ 97,877	$ 96,280	$ 94,716	$ 93,183	$ 91,682
Post-Operations Subtotal	-	-	-	-	-	-	-	-	-
plus Escalation	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost	124,517	127,590	130,750	133,999	137,338	140,771	144,300	147,928	151,657
Cumulative Total LCC	569,084	696,674	827,424	961,423	1,098,761	1,239,533	1,383,833	1,531,761	1,683,418
Total Cost (w/mgt reserve, & contingency)	151,495	155,235	159,080	163,032	167,095	171,271	175,565	179,979	184,516
Cumulative Total LCC	838,530	993,765	1,152,845	1,315,876	1,482,971	1,654,243	1,829,808	2,009,787	2,194,303
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013
Discounted Annual Cost	104,614	102,876	101,174	99,508	97,877	96,280	94,716	93,183	91,682
Cumulative Discounted LCC	$ 651,614	$ 754,489	$ 855,663	$ 955,172	$ 1,053,049	$ 1,149,330	$ 1,244,045	$ 1,337,229	$ 1,428,911

	2021	2022	2023	2024	2025	2026	2027	2028	2029
	18	19	20	21	22	23	24	25	26
	1.644	1.690	1.737	1.786	1.836	1.887	1.940	1.994	2.050
								DD&D	Closeout
								9/01/27-12/31/28	1/01/28-3/31/29
Total OPC (unescalated)	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-
Total OPC including escalation, mgt reserve, & contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
Total TEC (unescalated)	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-
Total TEC including escalation, mgt reserve, contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
TPC unescalated	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-
Total TPC including esc, mgt res, contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
discount factor @ OMB discount rate of	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
Tangible Costs	155,491	159,432	163,484	167,649	171,930	176,332	149,430	-	-
Managerial	3,650	3,752	3,857	3,965	4,076	4,191	3,588		
Supervision	23,465	24,122	24,798	25,492	26,206	26,939	23,069		
Labor (Production)	35,754	36,755	37,784	38,842	39,930	41,048	35,150		
(Maintenance)	35,461	36,454	37,474	38,524	39,602	40,711	34,862		
Maintenance of Equipment	21,117	21,709	22,317	22,941	23,584	24,244	20,761		
Propene	183	188	193	199	204	210	180		
Grout	1,217	1,251	1,286	1,322	1,359	1,397	1,196		
Consumables	14,964	15,383	15,814	16,257	16,712	17,180	14,711		
Utilities(Power&Water)	3,174	3,262	3,354	3,448	3,544	3,644	3,120		
STEAM	17	17	18	18	19	19	16		
Disposal (m3)	953	979	1,007	1,035	1,064	1,094	936		
Analytical	802	825	848	872	896	921	789		
Disposal (m3)	14,735	14,735	14,735	14,735	14,735	14,735	11,051		
Operations subtotal	155,491	159,432	163,484	167,649	171,930	176,332	149,430	-	-
plus Operations Contingency @	33,690	34,544	35,421	36,324	37,252	38,205	32,377	-	-
Total Operations (w/contingency	189,181	193,976	198,905	203,973	209,182	214,537	181,807	-	-
discount factor @ OMB discount rate of	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	$ 90,211	$ 88,769	$ 87,356	$ 85,971	$ 84,612	$ 83,281	$ 67,731	$ -	$ -
Decommission							2,272	4,544	1,136
Decontamination/surveillance							3,786	7,573	1,893
Demolition							7,573	15,145	3,786
Post-Operations Subtotal	-	-	-	-	-	-	13,631	27,262	6,815
plus Escalation	-	-	-	-	-	-	12,815	27,111	7,158
plus Post-Operations Contingency @	-	-	-	-	-	-	9,961	20,480	5,263
Total Post-Operations (w/ escalation & contingency)	-	-	-	-	-	-	36,407	74,853	19,237
discount factor @ OMB discount rate of	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,563	$ 26,762	$ 6,601
Total Cost	155,491	159,432	163,484	167,649	171,930	176,332	163,061	27,262	6,815
Cumulative Total LCC	1,838,909	1,998,341	2,161,825	2,329,474	2,501,404	2,677,736	2,840,797	2,868,059	2,874,874
Total Cost (w/mgt reserve, & contingency)	189,181	193,976	198,905	203,973	209,182	214,537	218,214	74,853	19,237
Cumulative Total LCC	2,383,484	2,577,460	2,776,365	2,980,338	3,189,520	3,404,057	3,622,271	3,697,124	3,716,361
discount factor @ OMB discount rate of	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	90,211	88,769	87,356	85,971	84,612	83,281	81,294	26,762	6,601
Cumulative Discounted LCC	$ 1,519,121	$ 1,607,890	$ 1,695,246	$ 1,781,217	$ 1,865,829	$ 1,949,110	$ 2,030,404	$ 2,057,166	$ 2,063,766

Treatment option 2 (High Cost WIPP)-8Acre

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
	1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318	1.355	1.393	1.432	1.472	1.513	1.556	1.599	1.644	1.690	1.737	1.786	1.836	1.887	1.940	1.994	2.050
Phase	Concept Design		Prelim Design	Final Design	Construction			Start-up		Operations					Operations											D&D	Closeout
Dates	10/1/03 -4/30/04		9/30/04-8/31/05	9/01/05-09/30/06	10/01/06-01/31/10			02/01/10-08/31/11		09/01/11-08/31/13					09/01/11-08/31/27											9/01/27-12/31/28	1/01/28-3/31/29

Part 1: estimates, Total Cost and 2003–2011

Other Project Cost (OPC)	min	mean	max	expected value	Total Cost	2003	2004	2005	2006	2007	2008	2009	2010	2011
OPC														
Conceptual Design, Project Mgt, & Permitting	29,135	45,031	60,926	45,031	45,031	[illegible]	8,472	18,251	16,886					
Testing and Start-up	11,321	17,497	23,674	17,497	17,497							-	4,374	13,123
Total OPC (unescalated)		62,528			62,528	[illegible]	8,472	18,251	16,886	-	-	-	4,374	13,123
plus escalation of		5,919			5,919	[illegible]	802	1,728	1,598	-	-	-	414	1,242
plus contingency of		49,414			49,414	1,123	6,695	14,423	13,345	-	-	-	3,457	10,371
Total OPC including escalation, mgt reserve, & contingency					117,860	$ [illegible]	$ 15,969	$ 34,401	$ 31,830	$ -	$ -	$ -	$ 8,245	$ 24,736
TEC					-									
ESH&Q	11,855	18,324	24,792	18,324	18,339				1,652	5,006	5,006	5,006	1,667	
Project mgt	8,278	12,794	17,310	12,794	12,804				1,154	3,496	3,496	3,496	1,164	
Construction, Equip, G&A & Procurement	108,084	167,054	226,024	167,054	167,191				15,062	45,643	45,643	45,643	15,199	
Total TEC (unescalated)		198,171			198,334		-	-	17,868	54,145	54,145	54,145	18,030	-
plus escalation of		20,200			20,217		-	-	1,821	5,519	5,519	5,519	1,838	-
plus contingency of		127,011			127,115		-	-	11,452	34,703	34,703	34,703	11,556	-
Total TEC including escalation, mgt reserve, contingency					345,666	$ -	-	$ -	$ 31,141	$ 94,367	$ 94,367	$ 94,367	$ 31,424	$ -
Total Project Cost (TPC)					-									
TPC unescalated		260,699			260,861	1,422	8,472	18,251	34,754	54,145	54,145	54,145	22,405	13,123
plus escalation of		26,119			26,135	135	802	1,728	3,420	5,519	5,519	5,519	2,252	1,242
plus contingency of		176,425			176,529	1,123	6,695	14,423	24,797	34,703	34,703	34,703	15,013	10,371
Total TPC including esc, mgt res, contingency		$ 463,243			463,526	$ 2,679	$ 15,969	$ 34,401	$ 62,971	$ 94,367	$ 94,367	$ 94,367	$ 39,669	$ 24,736
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost					383,483	$ 2,679	$ 15,325	$ 31,684	$ 55,659	$ 80,048	$ 76,821	$ 73,725	$ 29,743	$ 17,798
Operations (2080 hr-shil)	min	mean	max	expected value	-									
Tangible Costs					4,433,508	-	-	-	-	-	-	-	73,231	139,650
Managerial	1,747	2,184	2,730	2,220	60,781								2,244	2,769
Supervision	11,232	14,040	17,550	14,274	390,737								14,426	17,803
Labor (Production)	17,114	21,393	26,741	21,749	595,367								21,981	27,126
(Maintenance)	6,206	6,895	9,998	7,297	576,468								7,782	26,904
Maintenance of Equipment	10,924	12,138	17,600	12,846	352,359								13,698	16,022
Propane	87	109	137	111	3,043								112	139
Grout	582	728	910	740	20,260								748	923
Consumables	7,163	8,954	11,192	9,103	249,181								9,200	11,353
Utilities(Power&Water)	1,519	1,899	2,374	1,931	52,847								1,951	2,408
STEAM	8	10	13	10	278								10	13
Disposal (m3) 2,695.7	456	570	712	579	15,861								586	723
Analytical	384	480	600	488	13,359								493	609
Disposal (m3) 3545	206,849	258,562	323,202	262,871	2,102,968									32,859
Operations subtotal					4,433,508	-	-	-	-	-	-	-	73,231	139,650
plus Operations Contingency @	5.0%	15.0%	45.0%	22%	960,593	-	-	-	-	-	-	-	15,867	30,258
Total Operations (w/contingency)					5,394,102	-	-	-	-	-	-	-	89,097	169,908
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost					2,818,757	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 66,802	$ 122,256
Post Operations	min	mean	max	expected value	-									
Decommission	6,257	7,821	9,776	7,951	7,951									
Decontamination/surveillance	10,428	13,035	16,294	13,252	13,252									
Demolition	20,856	26,070	32,587	26,504	26,504									
Post-Operations Subtotal	37,541	46,926	58,657	47,708	47,708	-	-	-	-	-	-	-	-	-
plus Escalation					47,084	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @	15%	40%	58%	38%	35,705	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)					130,497	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost					48,926	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost					4,742,078	1,422	8,472	18,251	34,754	54,145	54,145	54,145	95,635	152,773
Cumulative Total LCC					-	1,422	9,893	28,144	62,899	117,044	171,189	225,334	320,969	473,742
Total Cost (w/mgt reserve, & contingency)					5,988,125	2,679	15,969	34,401	62,971	94,367	94,367	94,367	128,767	194,643
Cumulative Total LCC					-	2,679	18,648	53,050	116,021	210,388	304,754	399,121	527,888	722,531
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390
Discounted Annual Cost						2,679	15,325	31,684	55,659	80,048	76,821	73,725	96,545	140,055
Cumulative Discounted LCC					3,249,165	$ 2,679	$ 18,005	$ 49,689	$ 105,348	$ 185,396	$ 262,217	$ 335,942	$ 432,486	$ 572,541

Part 2: 2012–2029

Row	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total OPC (unescalated)	-	-	-	-														
plus escalation of	-	-	-	-														
plus contingency of	-	-	-	-														
Total OPC including escalation, mgt reserve, & contingency	$ -	$ -	$ -															
Total TEC (unescalated)	-	-	-	-														
plus escalation of	-	-	-	-														
plus contingency of	-	-	-	-														
Total TEC including escalation, mgt reserve, contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
TPC unescalated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus escalation of	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
plus contingency of	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total TPC including esc, mgt res, contingency	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
Tangible Costs	241,217	244,291	247,451	250,699	254,038	257,471	261,000	264,628	268,358	272,191	276,132	280,184	284,349	288,631	293,032	236,956	-	-
Managerial	2,847	2,927	3,009	3,093	3,179	3,268	3,360	3,454	3,551	3,650	3,752	3,857	3,965	4,076	4,191	3,588		
Supervision	18,301	18,814	19,341	19,882	20,439	21,011	21,599	22,204	22,826	23,465	24,122	24,798	25,492	26,206	26,939	23,069		
Labor (Production)	27,886	28,667	29,469	30,294	31,143	32,015	32,911	33,833	34,780	35,754	36,755	37,784	38,842	39,930	41,048	35,150		
(Maintenance)	27,657	28,432	29,228	30,046	30,887	31,752	32,641	33,555	34,495	35,461	36,454	37,474	38,524	39,602	40,711	34,862		
Maintenance of Equipment	16,470	16,931	17,406	17,893	18,394	18,909	19,438	19,983	20,542	21,117	21,709	22,317	22,941	23,584	24,244	20,761		
Propane	143	147	151	155	159	164	168	173	178	183	188	193	[illegible]	204	210	180		
Grout	949	976	1,003	1,031	1,060	1,089	1,120	1,151	1,184	1,217	1,251	1,286	1,322	1,359	1,397	1,196		
Consumables	11,671	11,998	12,334	12,679	13,034	13,399	13,774	14,160	14,557	14,964	15,383	15,814	16,257	16,712	17,180	14,711		
Utilities(Power&Water)	2,475	2,545	2,616	2,689	2,764	2,842	2,921	3,003	3,087	3,174	3,262	3,354	3,448	3,544	3,644	3,120		
STEAM	13	13	14	14	15	15	15	16	16	17	17	18	18	19	19	16		
Disposal (m3) 2,695.7	743	764	785	807	830	853	877	901	927	953	979	1,007	1,035	1,064	1,094	936		
Analytical	626	643	661	680	699	718	738	759	780	802	825	848	872	896	921	789		
Disposal (m3) 3545	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	131,436	98,577		
Operations subtotal	241,217	244,291	247,451	250,699	254,038	257,471	261,000	264,628	268,358	272,191	276,132	280,184	284,349	288,631	293,032	236,956	-	-
plus Operations Contingency @	52,264	52,930	53,614	54,318	55,042	55,785	56,550	57,336	58,144	58,975	59,829	60,707	61,609	62,537	63,490	51,340	-	-
Total Operations (w/contingency)	293,480	297,220	301,065	305,017	309,080	313,257	317,550	321,964	326,502	331,166	335,961	340,891	345,958	351,167	356,522	288,296	-	-
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	$ 202,661	$ 196,971	$ 191,476	$ 186,171	$ 181,047	$ 176,097	$ 171,316	$ 166,696	$ 162,231	$ 157,916	$ 153,746	$ 149,713	$ 145,815	$ 142,044	$ 138,398	$ 107,402	$ -	-
Decommission																2,272	4,544	1,136
Decontamination/surveillance																3,786	7,573	1,893
Demolition																7,573	15,145	3,786
Post-Operations Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,631	27,262	6,815
plus Escalation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12,815	27,111	7,158
plus Post-Operations Contingency @	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,961	20,480	5,263
Total Post-Operations (w/ escalation & contingency)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36,407	74,853	19,237
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,563	$ 26,762	$ 6,601
Total Cost	241,217	244,291	247,451	250,699	254,038	257,471	261,000	264,628	268,358	272,191	276,132	280,184	284,349	288,631	293,032	250,586	27,262	6,815
Cumulative Total LCC	714,959	959,250	1,206,700	1,457,399	1,711,438	1,968,909	2,229,909	2,494,537	2,762,895	3,035,086	3,311,219	3,591,403	3,875,752	4,164,382	4,457,414	4,708,001	4,735,262	4,742,078
Total Cost (w/mgt reserve, & contingency)	293,480	297,220	301,065	305,017	309,080	313,257	317,550	321,964	326,502	331,166	335,961	340,891	345,958	351,167	356,522	324,703	74,853	19,237
Cumulative Total LCC	1,016,011	1,313,232	1,614,297	1,919,314	2,228,394	2,541,651	2,859,201	3,181,165	3,507,667	3,838,833	4,174,794	4,515,685	4,861,643	5,212,810	5,569,332	5,894,035	5,968,888	5,988,125
discount factor @ OMB discount rate of	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684	2.797	2.914
Discounted Annual Cost	202,661	196,971	191,476	186,171	181,047	176,097	171,316	166,696	162,231	157,916	153,746	149,713	145,815	142,044	138,398	120,965	26,762	6,601
Cumulative Discounted LCC	$ 775,202	$ 972,172	$ 1,163,649	$ 1,349,820	$ 1,530,866	$ 1,706,963	$ 1,878,279	$ 2,044,975	$ 2,207,206	$ 2,365,122	$ 2,518,867	$ 2,668,581	$ 2,814,395	$ 2,956,440	$ 3,094,838	$ 3,215,803	$ 3,242,565	$ 3,249,165

Treatment option 4a (LOW cost WIPP)

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)		min	mean	max	expected value	Total Cost	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
							0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
							1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318	1.355	1.393	1.432	1.472
							Conceptual Design			Prelim Design	Final Design	Construction				Start-up		Operations		DD&D	Closeout
							10/1/04-9/30/05			10/01/05-09/30/06	10/01/06-06/28/08	6/29/08-06/28/12				06/29/12-06/29/14		06/29/14-06/29/16		6/30/16-9/31/17	9/31/17-12/31/17
Other Project Cost (OPC)																					
OPC																					
Conceptual Design, Project Mgt, & Permitting		36,651	56,647	78,643	56,647	56,647	2,832	11,329	11,329	11,329	11,329	8,497									
Testing and Start-up		13,572	20,977	28,381		20,977										7,342	10,488	3,147			
Total OPC (unescalated)			77,624			77,624	2,832	11,329	11,329	11,329	11,329	8,497	-		-	7,342	10,488	3,147			-
plus escalation of			12,057			12,057	440	1,760	1,760	1,760	1,760	1,320	-		-	1,140	1,629	489			-
plus contingency of			87,552			87,552	3,195	12,778	12,778	12,778	12,778	9,584	-	-	-	8,281	11,830	3,549			-
Total OPC including escalation, mgt reserve, & contingency						177,233	$ 6,467	$ 25,868	$ 25,868	$ 25,868	$ 25,868	$ 19,401	$ -	$ -	$ -	$ 16,763	$ 23,947	$ 7,184	$ -	$ -	$ -
TEC																					
ESH&Q		11,695	18,076	24,457	18,076	18,076			695	2,897	2,897	2,897	2,897	2,897	2,897						
Project mgt		8,166	12,621	17,076	12,621	12,621		1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402					
Construction, Equip, G&A & Procurement		106,863	165,166	223,470	165,166	165,166					30,030	30,030	30,030	30,030	30,030	15,015					
Total TEC (unescalated)			195,864			195,864	-	1,402	2,098	4,299	34,329	34,329	34,329	34,329	34,329	16,417					-
plus escalation of			30,653			30,653	-	219	328	673	5,373	5,373	5,373	5,373	5,373	2,569					-
plus contingency of			151,709			151,709	-	1,086	1,625	3,330	26,590	26,590	26,590	26,590	26,590	12,716					-
Total TEC including escalation, mgt reserve, contingency						378,226	$ -	$ 2,708	$ 4,051	$ 8,302	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 31,703	$ -	$ -	$ -	$ -	$ -
Total Project Cost (TPC)						-															
TPC unescalated			273,488			273,488	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	23,759	10,488	3,147	-	-	-
plus escalation of			42,710			42,710	440	1,979	2,088	2,433	7,132	6,692	5,373	5,373	5,373	3,710	1,629	489	-	-	-
plus contingency of			239,261			239,262	3,195	13,865	14,403	16,108	39,369	36,174	26,590	26,590	26,590	20,997	11,830	3,549	-	-	-
Total TPC including esc, mgt res, contingency			$ 555,459			555,459	$ 6,467	$ 28,576	$ 29,918	$ 34,170	$ 92,160	$ 85,693	$ 66,292	$ 66,292	$ 66,292	$ 48,466	$ 23,947	$ 7,184	$ -	$ -	$ -
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost						$ 442,687	$ 6,467	$ 27,424	$ 27,555	$ 30,202	$ 78,176	$ 69,760	$ 51,791	$ 49,704	$ 47,700	$ 33,468	$ 15,870	$ 4,569	$ -	$ -	$ -
Operations	2080 hr-shil	*min*	*mean*	*max*	expected value																
Tangible Costs						431,279	-	-	-	-	-	-	-	-	-	20,963	64,637	134,381	139,590	71,708	-
Managerial		1,747	2,184	2,730	2,220	9,629										475	1,463	3,009	3,093	1,590	
Supervision		20,218	25,272	31,590	25,693	111,420										5,492	16,932	34,813	35,788	18,395	
Labor (Production)		22,772	28,465	35,581	28,939	125,496										6,185	19,072	39,211	40,309	20,719	
(Maintenance)		6,365	7,072	10,254	7,485	34,246										1,688	5,204	10,700	11,000	5,654	
Maintenance of Equipment		9,904	11,004	15,956	11,646	53,288										2,626	8,098	16,650	17,116	8,798	
Propane		1,049	1,311	1,639	1,333	5,779										285	878	1,806	1,856	954	
Grout		318	397	497	404	1,752										86	266	547	563	289	
Consumables		12,334	15,418	19,272	15,675	67,974										3,350	10,330	21,239	21,833	11,222	
Utilities(Power&Water)		1,520	1,899	2,374	1,931	8,374										413	1,273	2,616	2,690	1,383	
STEAM		578	722	903	734	3,184										157	484	995	1,023	526	
Disposal (m3)	1,605.9	183	229	287	233	1,011										50	154	316	325	167	
Analytical		576	720	900	732	3,174										156	482	992	1,020	524	
WIPP Disposal (m3)	716	4,684	5,855	7,318	5,952	5,952												1,488	2,976	1,488	
Operations subtotal						431,279	-	-	-	-	-	-	-	-	-	20,963	64,637	134,381	139,590	71,708	-
plus Operations Contingency @		5.0%	15.0%	45.0%	22%	93,444	-	-	-	-	-	-	-	-	-	4,542	14,005	29,116	30,245	15,537	-
Total Operations (w/contingency)						524,723	-	-	-	-	-	-	-	-	-	25,505	78,641	163,497	169,835	87,245	-
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost						$ 328,478	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,612	$ 52,116	$ 103,984	$ 103,661	$ 51,104	$ -
		min	*mean*	*max*	expected value																
Post Operations																					
Decommission		6,564	8,205	10,256	8,341	8,341													1,668	3,337	3,337
Decontamination/survellance		10,940	13,674	17,093	13,902	13,902													2,780	5,561	5,561
Demolition		21,879	27,349	34,186	27,805	27,805													5,561	11,122	11,12; !
Post-Operations Subtotal		39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-	10,010	20,019	20,019
plus Escalation						22,028	-	-	-	-	-	-	-	-	-	-	-	-	3,933	8,646	9,449
plus Post-Operations Contingency @		15%	40%	58%	38%	27,149													5,252	10,797	11,100
Total Post-Operations (w/ escalation & contingency)						99,225	-	-	-	-	-	-	-	-	-	-	-	-	19,194	39,463	40,568
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost						$ 57,636	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,715	$ 23,116	$ 22,805
Total Cost						754,815	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	44,722	75,125	137,528	149,600	91,727	20,019
Cumulative Total LCC							2,832	15,564	28,991	44,620	90,279	133,105	167,435	201,764	236,094	280,816	355,941	493,469	643,069	734,796	754,815
Total Cost (w/mgt reserve, & contingency)						1,179,407	6,467	28,576	29,918	34,170	92,160	85,693	66,292	66,292	66,292	73,971	102,589	170,682	189,029	126,707	40,568
Cumulative Total LCC							6,467	35,043	64,961	99,131	191,291	276,984	343,276	409,569	475,861	549,833	652,421	823,103	1,012,132	1,138,839	1,179,407
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost							6,467	27,424	27,555	30,202	78,176	69,760	51,791	49,704	47,700	51,080	67,986	108,553	115,376	74,220	22,805
Cumulative Discounted LCC						$ 828,801	$ 6,467	$ 33,891	$ 61,446	$ 91,648	$ 169,824	$ 239,584	$ 291,375	$ 341,079	$ 388,780	$ 439,860	$ 507,846	$ 616,399	$ 731,776	$ 805,996	$ 828,801

Treatment option 4a (HIGH cost WIPP)

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)		min	mean	max	expected value	Total Cost	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
							0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
							1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318	1.355	1.393	1.432	1.472
							Conceptual Design			Prelim Design	Final Design			Construction		Start-up		Operations		DD&D	Closeout
							10/1/04-9/30/05			10/01/05-09/30/06	10/01/06-06/28/08		6/29/08-06/28/12			06/29/12-06/29/14		06/29/14-06/29/16		6/30/16-9/31/17	9/31/17-12/31/17
Other Project Cost (OPC)																					
OPC																					
Conceptual Design, Project Mgt, & Permitting		36,651	56,647	76,643	56,647	56,647	2,832	11,329	11,329	11,329	11,329	8,497									
Testing and Start-up		13,572	20,977	28,381	20,977	20,977							-			7,342	10,488	3,147			
Total OPC (unescalated)			77,624			77,624	2,832	11,329	11,329	11,329	11,329	8,497	-	-	-	7,342	10,488	3,147			-
plus escalation of			12,057			12,057	440	1,760	1,760	1,760	1,760	1,320	-	-	-	1,140	1,629	489			-
plus contingency of			87,552			87,552	3,195	12,778	12,778	12,778	12,778	9,584	-	-	-	8,281	11,830	3,549			-
Total OPC including escalation, mgt reserve, & contingency						177,233	$ 6,467	$ 25,868	$ 25,868	$ 25,868	$ 25,868	$ 19,401	$ -	$ -	$ -	$ 16,763	$ 23,947	$ 7,184	$ -	$ -	$ -
TEC																					
ESH&Q		11,895	18,078	24,457	18,076	18,076			695	2,897	2,897	2,897	2,897	2,897	2,897						
Project mgt		8,166	12,621	17,076	12,621	12,621		1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402					
Construction, Equip, G&A & Procurement		106,863	165,166	223,470	165,166	165,166					30,030	30,030	30,030	30,030	30,030	15,015					
Total TEC (unescalated)			195,864			195,864	-	1,402	2,098	4,299	34,329	34,329	34,329	34,329	34,329	16,417					-
plus escalation of			30,853			30,653	-	219	328	673	5,373	5,373	5,373	5,373	5,373	2,569					-
plus contingency of			151,709			151,709	-	1,086	1,625	3,330	26,590	26,590	26,590	26,590	26,590	12,716					-
Total TEC including escalation, mgt reserve, contingency						378,226	$ -	$ 2,708	$ 4,051	$ 8,302	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 31,703	$ -	$ -	$ -	$ -	$ -
Total Project Cost (TPC)						-															
TPC unescalated			273,488			273,488	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	23,759	10,488	3,147	-	-	-
plus escalation of			42,710			42,710	440	1,979	2,088	2,433	7,132	6,692	5,373	5,373	5,373	3,710	1,629	489	-	-	-
plus contingency of			239,261			239,262	3,195	13,865	14,403	16,108	39,369	36,174	26,590	26,590	26,590	20,997	11,830	3,549	-	-	-
Total TPC including esc, mgt res, contingency			$ 555,459			555,459	$ 6,467	$ 28,576	$ 29,918	$ 34,170	$ 92,160	$ 85,693	$ 66,292	$ 66,292	$ 66,292	$ 48,466	$ 23,947	$ 7,184	$ -	$ -	$ -
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost						$ 442,687	$ 6,467	$ 27,424	$ 27,555	$ 30,202	$ 78,176	$ 69,760	$ 51,791	$ 49,704	$ 47,700	$ 33,468	$ 15,870	$ 4,569	$ -	$ -	$ -
Operations	2080 hr-shif	min	mean	max	expected value																
Tangible Costs						478,420	-	-	-	-	-	-	-	-	-	20,963	64,637	146,167	163,161	83,493	-
Managerial		1,747	2,184	2,730	2,220	9,629										475	1,463	3,009	3,093	1,590	
Supervision		20,218	25,272	31,590	25,693	111,420										5,492	16,932	34,813	35,788	18,395	
Labor (Production)		22,772	28,465	35,581	28,939											6,185	19,072	39,211	40,309	20,719	
(Maintenance)		6,365	7,072	10,254	7,485	34,246										1,688	5,204	10,700	11,000	5,654	
Maintenance of Equipment		9,904	11,004	15,956	11,646	53,288										2,626	8,098	16,650	17,116	8,798	
Propane		1,049	1,311	1,639	1,333	5,779										285	878	1,806	1,856	954	
Grout		318	397	497	404	1,752										86	266	547	563	289	
Consumables		12,334	15,418	19,272	15,675	67,974										3,350	10,330	21,239	21,833	11,222	
Utilities(Power&Water)		1,520	1,899	2,374	1,931	8,374										413	1,273	2,616	2,690	1,383	
STEAM		578	722	903	734	3,184										157	484	995	1,023	526	
Disposal (m3)	1,605.9	183	229	287	233	1,011										50	154	316	325	167	
Analytical		576	720	900	732	3,174										156	482	992	1,020	524	
WIPP Disposal (m3)	716	41,778	52,223	65,279	53,093	53,093												13,273	26,547	13,273	
Operations subtotal						478,420	-	-	-	-	-	-	-	-	-	20,963	64,637	146,167	163,161	83,493	-
plus Operations Contingency @		5.0%	15.0%	45.0%	22%	103,658	-	-	-	-	-	-	-	-	-	4,542	14,005	31,669	35,352	18,090	-
Total Operations (w/contingency)						582,078	-	-	-	-	-	-	-	-	-	25,505	78,641	177,836	198,512	101,583	-
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost						$ 363,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,612	$ 52,116	$ 113,103	$ 121,164	$ 59,503	$ -
		min	mean	max	expected value																
Post Operations																					
Decommission		6,564	8,205	10,256	8,341	8,341													1,668	3,337	3,337
Decontamination/survellance		10,940	13,674	17,093	13,902	13,902													2,780	5,561	5,561
Demolition		21,879	27,349	34,186	27,805	27,805													5,561	11,122	11,122
Post-Operations Subtotal		39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-	10,010	20,019	20,019
plus Escalation						22,028	-	-	-	-	-	-	-	-	-	-	-	-	3,933	8,646	9,449
plus Post-Operations Contingency @		15%	40%	58%	38%	27,149	-	-	-	-	-	-	-	-	-	-	-	-	5,252	10,797	11,100
Total Post-Operations (w/ escalation & contingency)						99,225	-	-	-	-	-	-	-	-	-	-	-	-	19,194	39,463	40,568
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost						$ 57,636	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,715	$ 23,116	$ 22,805
Total Cost						801,956	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	44,722	75,125	149,313	173,171	103,512	20,019
Cumulative Total LCC							2,832	15,564	28,991	44,620	90,279	133,105	167,435	201,764	236,094	280,816	355,941	505,254	678,425	781,937	801,956
Total Cost (w/mgt reserve, & contingency)						1,236,762	6,467	28,576	29,918	34,170	92,160	85,693	66,292	66,292	66,292	73,971	102,589	185,020	217,706	141,046	40,568
Cumulative Total LCC							6,467	35,043	64,961	99,131	191,291	276,984	343,276	409,569	475,861	549,833	652,421	837,441	1,055,148	1,196,194	1,236,762
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779
Discounted Annual Cost							6,467	27,424	27,555	30,202	78,176	69,760	51,791	49,704	47,700	51,080	67,986	117,672	132,880	82,619	22,805
Cumulative Discounted LCC						$ 863,823	$ 6,467	$ 33,891	$ 61,446	$ 91,648	$ 169,824	$ 239,584	$ 291,375	$ 341,079	$ 388,780	$ 439,860	$ 507,846	$ 625,519	$ 758,398	$ 841,018	$ 863,823

Treatment option 4a-4acre (LOW cost WIPP)

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

Other Project Cost (OPC)	min	mean	max	expected value	Total Cost
OPC					
Conceptual Design, Project Mgt. & Permitting	36,651	56,647	76,643	56,647	56,647
Testing and Start-up	13,572	20,977	28,381	20,977	20,977
Total OPC (unescalated)		77,624			77,624
plus escalation of		12,057			12,057
plus contingency of		87,552			87,552
Total OPC including escalation, mgt reserve, & contingency					177,233
TEC					
ESH&Q	11,695	18,076	24,457	18,076	18,076
Project mgt	8,166	12,621	17,076	12,621	12,621
Construction, Equip, G&A & Procurement	106,863	165,166	223,470	165,166	165,166
Total TEC (unescalated)		195,864			195,864
plus escalation of		30,653			30,653
plus contingency of		151,709			151,709
Total TEC including escalation, mgt reserve, contingency					378,226
					-
Total Project Cost (TPC)					-
TPC unescalated		273,488			273,488
plus escalation of		42,710			42,710
plus contingency of		239,261			239,262
Total TPC Including esc, mgt res, contingency		$ 555,459			555,459
discount factor @ OMB discount rate of	4.20%				
Discounted Annual Cost					$ 442,687
Operations 2080 hr-shif	min	mean	max	expected value	
Tangible Costs					1,357,453
Managerial	1,747	2,184	2,730	2,220	30,378
Supervision	20,218	25,272	31,590	25,693	351,515
Labor (Production)	22,772	28,465	35,581	28,939	395,925
(Maintenance)	6,365	7,072	10,254	7,485	104,831
Maintenance of Equipment	9,904	11,004	15,956	11,646	163,119
Propane	1,049	1,311	1,639	1,333	18,233
Grout	318	397	497	404	5,526
Consumables	12,334	15,418	19,272	15,675	214,450
Utilities(Power&Water)	1,520	1,899	2,374	1,931	26,419
STEAM	578	722	903	734	10,044
Disposal (m3) 1,605.9	183	229	287	233	3,190
Analytical	576	720	900	732	10,015
Disposal (m3) 716	4,684	5,855	7,318	5,952	23,809
Operations subtotal					1,357,453
plus Operations Contingency @	5.0%	15.0%	45.0%	22%	294,115
Total Operations (w/contingency)					1,651,568
discount factor @ OMB discount rate of	4.20%				
Discounted Annual Cost					$ 911,400
	min	mean	max	expected value	
Post Operations					
Decommission	6,564	8,205	10,256	8,341	8,341
Decontamination/surveillance	10,940	13,674	17,093	13,902	13,902
Demolition	21,879	27,349	34,186	27,805	27,805
Post-Operations Subtotal	39,382	49,228	61,535	50,048	50,048
plus Escalation					35,714
plus Post-Operations Contingency @	15%	40%	58%	38%	32,304
Total Post-Operations (w/ escalation & contingency)					118,066
discount factor @ OMB discount rate of	4.20%				
Discounted Annual Cost					$ 52,926
Total Cost					1,680,989
Cumulative Total LCC					
Total Cost (w/mgt reserve, & contingency)					2,325,093
Cumulative Total LCC					
discount factor @ OMB discount rate of	4.20%				
Discounted Annual Cost					
Cumulative Discounted LCC					$ 1,407,014

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318	1.355	1.393	1.432	1.472	1.513	1.556	1.599	1.644	1.690	1.737
	Conceptual Design			Prelim Design	Final Design			Construction		Start-up		Operations								DD&D	Closeout
	10/1/04-9/30/05			10/01/05-09/30/06	10/01/06-06/28/08		6/29/08-06/28/12			06/29/12-06/29/14					06/30/14-06/31/22				7/1/22-7/31/23	8/1/23-12/31/23	
OPC																					
Conceptual Design, Project Mgt. & Permitting	2,832	11,329	11,329	11,329	11,329	8,497															
Testing and Start-up							-			7,342	10,488	3,147									
Total OPC (unescalated)	2,832	11,329	11,329	11,329	11,329	8,497	-	-	-	7,342	10,488	3,147	-								-
plus escalation of	440	1,760	1,760	1,760	1,760	1,320	-	-	-	1,140	1,629	489	-								-
plus contingency of	3,195	12,778	12,778	12,778	12,778	9,584	-	-	-	8,281	11,830	3,549	-								-
Total OPC including escalation, mgt reserve, & contingency	$ 6,467	$ 25,868	$ 25,868	$ 25,868	$ 25,868	$ 19,401	$ -	$ -	$ -	$ 16,763	$ 23,947	$ 7,184	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
TEC																					
ESH&Q			695	2,897	2,897	2,897	2,897	2,897	2,897												
Project mgt		1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402											
Construction, Equip, G&A & Procurement					30,030	30,030	30,030	30,030	30,030	15,015											
Total TEC (unescalated)	-	1,402	2,098	4,299	34,329	34,329	34,329	34,329	34,329	16,417	-	-	-		-	-		-	-		-
plus escalation of	-	219	328	673	5,373	5,373	5,373	5,373	5,373	2,569	-	-	-		-	-		-	-		-
plus contingency of	-	1,086	1,625	3,330	26,590	26,590	26,590	26,590	26,590	12,716	-	-	-								-
Total TEC including escalation, mgt reserve, contingency	$ -	$ 2,708	$ 4,051	$ 8,302	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 31,703	$ -	$ -	$ -	- I	$ -		$ -	$ -	$	$ -	$ -
Total Project Cost (TPC)																					
TPC unescalated	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	23,759	10,488	3,147	-	-	-	-	-	-	-	-	-
plus escalation of	440	1,979	2,088	2,433	7,132	6,692	5,373	5,373	5,373	3,710	1,629	489	-	-	-	-	-	-	-	-	-
plus contingency of	3,195	13,865	14,403	16,108	39,369	36,174	26,590	26,590	26,590	20,997	11,830	3,549	-	-	-	-	-	-	-	-	-
Total TPC Including esc, mgt res, contingency	$ 6,467	$ 28,576	$ 29,918	$ 34,170	$ 92,160	$ 85,693	$ 66,292	$ 66,292	$ 66,292	$ 48,466	$ 23,947	$ 7,184	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost	$ 6,467	$ 27,424	$ 27,555	$ 30,202	$ 78,176	$ 69,760	$ 51,791	$ 49,704	$ 47,700	$ 33,468	$ 15,870	$ 4,569	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operations																					
Tangible Costs	-	-	-	-	-	-	-	-	-	20,963	64,637	134,381	139,590	143,416	145,796	149,795	153,906	158,132	162,476	84,362	-
Managerial										475	1,463	3,009	3,093	3,179	3,268	3,360	3,454	3,551	3,650	1,876	
Supervision										5,492	16,932	34,813	35,788	36,790	37,820	38,879	39,968	41,087	42,237	21,710	
Labor (Production)										6,185	19,072	39,211	40,309	41,438	42,598	43,791	45,017	46,277	47,573	24,453	
(Maintenance)										1,688	5,204	10,700	11,000	11,308	11,017	11,326	11,643	11,969	12,304	6,673	
Maintenance of Equipment										2,626	8,098	16,650	17,116	17,595	17,143	17,623	18,116	18,624	19,145	10,383	
Propane										285	878	1,806	1,856	1,908	1,962	2,017	2,073	2,131	2,191	1,126	
Grout										86	266	547	563	578	595	611	628	646	664	341	
Consumables										3,350	10,330	21,239	21,833	22,445	23,073	23,719	24,383	25,066	25,768	13,245	
Utilities(Power&Water)										413	1,273	2,616	2,690	2,765	2,842	2,922	3,004	3,088	3,174	1,632	
STEAM										157	484	995	1,023	1,051	1,081	1,111	1,142	1,174	1,207	620	
Disposal (m3)										50	154	316	325	334	343	353	363	373	383	197	
Analytical										156	482	992	1,020	1,048	1,077	1,108	1,139	1,171	1,203	619	
Disposal (m3)												1,488	2,976	2,976	2,976	2,976	2,976	2,976	2,976	1,488	
Operations subtotal	-	-	-	-	-	-	-	-	-	20,963	64,637	134,381	139,590	143,416	145,796	149,795	153,906	158,132	162,476	84,362	-
plus Operations Contingency @	-	-	-	-	-	-	-	-	-	4,542	14,005	29,116	30,245	31,073	31,589	32,456	33,346	34,262	35,203	18,278	-
Total Operations (w/contingency)	-	-	-	-	-	-	-	-	-	25,505	78,641	163,497	169,835	174,489	177,385	182,250	187,252	192,394	197,679	102,640	-
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,612	$ 52,116	$ 103,984	$ 103,661	$ 102,209	$ 99,717	$ 98,322	$ 96,949	$ 95,596	$ 94,263	$ 46,971	$ -
Post Operations																					
Decommission																				4,171	4,171
Decontamination/surveillance																				6,951	6,951
Demolition																				13,902	13,902
Post-Operations Subtotal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25,024	25,024
plus Escalation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17,265	18,449
plus Post-Operations Contingency @	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,929	16,375
Total Post-Operations (w/ escalation & contingency)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58,218	59,848
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,642	$ 26,284
Total Cost	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	44,722	75,125	137,528	139,590	143,416	145,796	149,795	153,906	158,132	162,476	109,386	25,024
Cumulative Total LCC	2,832	15,564	28,991	44,620	90,279	133,105	167,435	201,764	236,094	280,816	355,941	493,469	633,059	776,475	922,271	1,072,066	1,225,971	1,384,103	1,546,579	1,655,965	1,680,989
Total Cost (w/mgt reserve, & contingency)	6,467	28,576	29,918	34,170	92,160	85,693	66,292	66,292	66,292	73,971	102,589	170,682	169,835	174,489	177,385	182,250	187,252	192,394	197,679	160,858	59,848
Cumulative Total LCC	6,467	35,043	64,961	99,131	191,291	276,984	343,276	409,569	475,861	549,833	652,421	823,103	992,938	1,167,427	1,344,812	1,527,062	1,714,314	1,906,708	2,104,387	2,265,245	2,325,093
discount factor @ OMB discount rate of	1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost	6,467	27,424	27,555	30,202	78,176	69,760	51,791	49,704	47,700	51,080	67,986	108,553	103,661	102,209	99,717	98,322	96,949	95,596	94,263	73,613	26,284
Cumulative Discounted LCC	$ 6,467	$ 33,891	$ 61,446	$ 91,648	$ 169,824	$ 239,584	$ 291,375	$ 341,079	$ 388,780	$ 439,860	$ 507,846	$ 616,399	$ 720,060	$ 822,269	$ 921,986	$ 1,020,308	$ 1,117,257	$ 1,212,853	$ 1,307,116	$ 1,380,730	$ 1,407,014

Treatment option 4a-4acre (HIGH cost WIPP)

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

							2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
							0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
							1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318	1.355	1.393	1.432	1.472	1.513	1.556	1.599	1.644	1.690	1.737
							Conceptual Design			Prelim Design	Final Design	Construction				Start-up		Operations								DD&D	Closeout
								10/1/04-9/30/05		10/01/05-09/30/06	10/01/06-06/28/08	6/29/08-06/28/12				06/29/12-06/29/14		06/30/14-06/31/22							7/1/22-7/31/23	8/1/23-12/31/23
Other Project Cost (OPC)		*min*	*mean*	*max*	*expected value*	Total Cost																					
OPC																											
Conceptual Design, Project Mgt. & Permitting		36,651	56,647	76,643	56,647	56,647	2,832	11,329	11,329	11,329	11,329	8,497															
Testing and Start-up		13,572	20,977	28,381	20,977	20,977							-			7,342	10,488	3,147									
Total OPC (unescalated)			77,624			77,624	2,832	11,329	11,329	11,329	11,329	8,497	-	-	-	7,342	10,488	3,147	-	-	-			-			-
plus escalation of			12,057			12,057	440	1,760	1,760	1,760	1,760	1,320	-	-	-	1,140	1,629	489	-	-	-						-
plus contingency of			87,552			87,552	3,195	12,778	12,778	12,778	12,778	9,584	-	-	-	8,281	11,830	3,549	-	-	-						-
Total OPC including escalation, mgt reserve, & contingency						177,233	$ 6,467	$ 25,868	$ 25,868	$ 25,868	$ 25,868	$ 19,401	$ -	$ -	$ -	$ 16,763	$ 23,947	$ 7,184	$ -	$ -	$ - 8	$ -	$ -	$ -	$ -	$ - 8	-
TEC																											
ESH&Q		11,695	18,076	24,457	18,076	18,076			695	2,897	2,897	2,897	2,897	2,897	2,897												
Project mgt		8,166	12,621	17,076	12,621	12,621		1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402											
Construction, Equip, G&A & Procurement		106,863	165,166	223,470	165,166	165,166					30,030	30,030	30,030	30,030	30,030	15,015											
Total TEC (unescalated)			195,864			195,864	-	1,402	2,098	4,299	34,329	34,329	34,329	34,329	34,329	16,417					-			-			-
plus escalation of			30,653			30,653	-	219	328	673	5,373	5,373	5,373	5,373	5,373	2,569					-			-			-
plus contingency of			151,709			151,709	-	1,086	1,625	3,330	26,590	26,590	26,590	26,590	26,590	12,716					-			-			-
Total TEC including escalation, mgt reserve, contingency						378,226	$ -	$ 2,708	$ 4,051	$ 8,302	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 31,703	$				- 8	- 1			- $		- 1	-
						-																					
Total Project Cost (TPC)						-																					
TPC unescalated			273,488			273,488	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	23,759	10,488	3,147	-		-	-	-	-		-	-
plus escalation of			42,710			42,710	440	1,979	2,088	2,433	7,132	6,692	5,373	5,373	5,373	3,710	1,629	489	-	-	-	-	-	-		-	-
plus contingency of			239,261			239,262	3,195	13,865	14,403	16,108	39,369	36,174	26,590	26,590	26,590	20,997	11,830	3,549	-	-	-	-	-	-		-	-
Total TPC including esc, mgt res, contingency			$ 555,459			555,459	$ 6,467	$ 28,576	$ 29,918	$ 34,170	$ 92,160	$ 85,693	$ 66,292	$ 66,292	$ 66,292	$ 48,466	$ 23,947	$ 7,184	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost						$ 442,687	$ 6,467	$ 27,424	$ 27,555	$ 30,202	$ 78,176	$ 69,760	$ 51,791	$ 49,704	$ 47,700	$ 33,468	$ 15,870	$ 4,569	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operations	2080 hr-shif	*min*	*mean*	*max*	*expected value*																						
Tangible Costs						1,546,017	-	-	-	-	-	-	-	-	-	20,963	64,637	146,167	163,161	166,986	169,366	173,365	177,476	181,702	186,047	96,147	-
Managerial		1,747	2,184	2,730	2,220	30,378										475	1,463	3,009	3,093	3,179	3,268	3,360	3,454	3,551	3,650	1,876	
Supervision		20,218	25,272	31,590	25,693	351,515										5,492	16,932	34,813	35,788	36,790	37,820	38,879	39,968	41,087	42,237	21,710	
Labor (Production)		22,772	28,465	35,581	28,939	395,925										6,185	19,072	39,211	40,309	41,438	42,598	43,791	45,017	46,277	47,573	24,453	
(Maintenance)		6,365	7,072	10,254	7,485	104,831										1,688	5,204	10,700	11,000	11,308	11,017	11,326	11,643	11,969	12,304	6,673	
Maintenance of Equipment		9,904	11,004	15,956	11,646	163,119										2,626	8,098	16,650	17,116	17,595	17,143	17,623	18,116	18,624	19,145	10,383	
Propane		1,049	1,311	1,639	1,333	18,233										285	878	1,806	1,856	1,908	1,962	2,017	2,073	2,131	2,191	1,126	
Grout		318	397	497	404	5,526										86	266	547	563	578	595	611	628	646	664	[illegible]	
Consumables		12,334	15,418	19,272	15,675	214,450										3,350	10,330	21,239	21,833	22,445	23,073	23,719	24,383	25,066	25,768	13,245	
Utilities(Power&Water)		1,520	1,899	2,374	1,931	26,419										413	1,273	2,616	2,690	2,765	2,842	2,922	3,004	3,088	3,174	1,632	
STEAM		578	722	903	734	10,044										157	484	995	1,023	1,051	1,081	1,111	1,142	1,174	1,207	620	
Disposal (m3)	1,605.9	183	229	287	233	3,190										50	154	316	325	334	343	353	363	373	383	197	
Analytical		576	720	900	732	10,015										156	482	992	1,020	1,048	1,077	1,108	1,139	1,171	1,203	619	
Disposal (m3)	716	41,778	52,223	65,279	53,093	212,373												13,273	26,547	26,547	26,547	26,547	26,547	26,547	26,547	13,273	
Operations subtotal						1,546,017	-	-	-	-	-	-	-	-	-	20,963	64,637	146,167	163,161	166,986	169,366	173,365	177,476	181,702	186,047	96,147	-
plus Operations Contingency @		5.0%	15.0%	45.0%	22%	334,970	-	-	-	-	-	-	-	-	-	4,542	14,005	31,669	35,352	36,180	36,696	37,562	38,453	39,369	40,310	20,832	-
Total Operations (w/contingency)						1,880,988	-	-	-	-	-	-	-	-	-	25,505	78,641	177,836	198,512	203,166	206,062	210,928	215,929	221,071	226,357	116,979	-
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost						$ 1,035,747	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,612	$ 52,116	$ 113,103	$ 121,164	$ 119,007	$ 115,838	$ 113,794	$ 111,796	$ 109,845	$ 107,938	$ 53,533	$ -
		min	*mean*	*max*	*expected value*																						
Post Operations																											
Decommission		6,564	8,205	10,256	8,341	8,341																				4,171	4,171
Decontamination/survellance		10,940	13,674	17,093	13,902	13,902																				6,951	6,951
Demolition		21,879	27,349	34,186	27,805	27,805																				13,902	13,902
Post-Operations Subtotal		39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25,024	25,024
plus Escalation						35,714	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17,265	18,449
plus Post-Operations Contingency @		15%	40%	58%	38%	32,304	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,929	16,375
Total Post-Operations (w/ escalation & contingency)						118,066	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58,218	59,848
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost						$ 52,926	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,642	$ 26,284
Total Cost						1,869,553	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	44,722	75,125	149,313	163,161	166,986	169,366	173,365	177,476	181,702	186,047	121,171	25,024
Cumulative Total LCC							2,832	15,564	28,991	44,620	90,279	133,105	167,435	201,764	236,094	280,816	355,941	505,254	668,415	835,401	1,004,767	1,178,133	1,355,609	1,537,311	1,723,358	1,844,529	1,869,553
Total Cost (w/mgt reserve, & contingency)						2,554,513	6,467	28,576	29,918	34,170	92,160	85,693	66,292	66,292	66,292	73,971	102,589	185,020	198,512	203,166	206,062	210,928	215,929	221,071	226,357	175,197	59,848
Cumulative Total LCC							6,467	35,043	64,961	99,131	191,291	276,984	343,276	409,569	475,861	549,833	652,421	837,441	1,035,954	1,239,120	1,445,183	1,656,110	1,872,040	2,093,111	2,319,467	2,494,665	2,554,513
discount factor @ OMB discount rate of		4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638	1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277
Discounted Annual Cost							6,467	27,424	27,555	30,202	78,176	69,760	51,791	49,704	47,700	51,080	67,986	117,672	121,164	119,007	115,838	113,794	111,796	109,845	107,938	80,175	26,284
Cumulative Discounted LCC						$ 1,531,360	$ 6,467	$ 33,891	$ 61,446	$ 91,648	$ 169,824	$ 239,584	$ 291,375	$ 341,079	$ 388,780	$ 439,860	$ 507,846	$ 625,519	$ 746,683	$ 865,690	$ 981,528	$ 1,095,321	$ 1,207,118	$ 1,316,963	$ 1,424,901	$ 1,505,076	$ 1,531,360

Treatment option 4a (LOW cost WIPP)-8Acre

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)	min	mean	max	expected value	Total Cost	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
						0	1	2	3	4	5	6	7	8	9	10	11	12
						1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318		1.393
						Conceptual Design			Prelim Design	Final Design	Construction				Start-up			
						10/1/04-9/30/05			10/01/05-09/30/06	10/01/06-06/28/08	6/29/08-06/28/12				06/29/12-06/29/14			
Other Project Cost (OPC)																		
OPC																		
Conceptual Design, Project Mgt, & Permitting	36,651	56,647	76,643	56,647	56,647	2,832	11,329	11,329	11,329	11,329	8,497							
Testing and Start-up	13,572	20,977	28,381	20,977	20,977							-			7,342	10,488	3,147	
Total OPC (unescalated)		77,624			77,624	2,832	11,329	11,329	11,329	11,329	8,497	-			7,342	10,488	3,147	
plus escalation of		12,057			12,057	440	1,760	1,760	1,760	1,760	1,320	-			1,140	1,629	489	
plus contingency of		87,552			87,552	3,195	12,778	12,778	12,778	12,778	9,584	-		-	$ 16,763	$ 23,880	$ 3,568	$
Total OPC including escalation, mgt reserve, & contingency					177,233	$ 6,467	$ 25,868	$ 25,868	$ 25,868	$ 25,868	$ 19,401	$ -	$ -	$				
TEC																		
ESH&Q	11,695	18,076	24,457	18,076	18,076			695	2,897	2,897	2,897	2,897	2,897	2,897				
Project mgt	8,168	12,821	17,076	12,621	12,621		1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402			
Construction, Equip, G&A & Procurement	106,863	165,166	223,470	165,166	165,166					30,030	30,030	30,030	30,030	30,030	15,015			
Total TEC (unescalated)		195,864			195,864	-	1,402	2,098	4,299	34,329	34,329	34,329	34,329	34,329	16,417	-	-	-
plus escalation of		30,653			30,653	-	219	328	673	5,373	5,373	5,373	5,373	5,373	2,569	-	-	-
plus contingency of		151,709			151,709	-	1,086	1,625	3,330	26,590	26,590	26,590	26,590	26,590	12,716	-	-	-
Total TEC including escalation, mgt reserve, contingency					378,226	$ -	$ 2,708	$ 4,051	$ 8,302	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 31,703	$ -	$ -	$ -
					-													
Total Project Cost (TPC)					-													
TPC unescalated		273,488			273,488	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	23,759	10,488	3,147	-
plus escalation of		42,710			42,710	440	1,979	2,088	2,433	7,132	6,692	5,373	5,373	5,373	3,710	1,629	489	-
plus contingency of		239,261			239,262	3,195	13,865	14,403	16,108	39,369	36,174	26,590	26,590	26,590	20,997	11,830	3,549	-
Total TPC including esc, mgt res, contingency		$ 555,459			555,459	$ 6,467	$ 28,576	$ 29,918	$ 34,170	$ 92,160	$ 85,693	$ 66,292	$ 66,292	$ 66,292	$ 48,466	$ 23,947	$ 7,184	$ -
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost					$ 442,687	$ 6,467	$ 27,424	$ 27,555	$ 30,202	$ 78,176	$ 69,760	$ 51,791	$ 49,704	$ 47,700	$ 33,468	$ 15,870	$ 4,569	$ -
Operations 2080 hr-shif	min	mean	max	expected value														
Tangible Costs					2,745,513	-	-	-	-	-	-	-	-	-	62,876	127,884	132,953	138,122
Managerial	1,747	2,184	2,730	2,220	61,769										1,423	2,927	3,009	3,093
Supervision	20,218	25,272	31,590	25,693	714,751										16,471	33,865	34,813	35,788
Labor (Production)	22,772	28,465	35,581	28,939	805,051										18,552	38,143	39,211	40,309
(Maintenance)	6,365	7,072	10,254	7,485	208,897										5,063	9,865	10,141	10,425
Maintenance of Equipment	9,904	11,004	15,956	11,646	325,050										7,878	15,350	15,780	16,222
Propane	1,049	1,311	1,639	1,333	37,074										854	1,757	1,806	1,856
Grout	318	397	497	404	11,236										259	532	547	563
Consumables	12,334	15,418	19,272	15,675	436,050										10,049	20,660	21,239	21,833
Utilities(Power&Water)	1,520	1,899	2,374	1,931	53,719										1,238	2,545	2,616	2,690
STEAM	578	722	903	734	20,423										471	968	995	1,023
Disposal (m3) 1,605.9	183	229	287	233	6,486										149	307	316	325
Analytical	576	720	900	732	20,363										469	965	992	1,020
WIPP Disposal (m3) 716	4,684	5,855	7,318	5,952	44,642												1,488	2,976
Operations subtotal					2,745,513	-	-	-	-	-	-	-	-	-	62,876	127,884	132,953	138,122
plus Operations Contingency @	5.0%	15.0%	45.0%	22%	594,861	-	-	-	-	-	-	-	-	-	13,623	27,708	28,806	29,926
Total Operations (w/contingency)					3,340,375	-	-	-	-	-	-	-	-	-	76,499	155,592	161,759	168,048
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	$ 52,646	$ 101,509	$ 102,678	$ 102,638
Discounted Annual Cost					$ 1,614,113	$ -	$ -	5 -	$ -	$ -	$ -	$ -	$ -	$				
	min	mean	max	expected value														
Post Operations																		
Decommission	6,564	8,205	10,256	8,341	8,341													
Decontamination/survellance	10,940	13,674	17,093	13,902	13,902													
Demolition	21,879	27,349	34,186	27,805	27,805													
Post-Operations Subtotal	39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-	-
plus Escalation					56,047	-	-	-	-	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @	15%	40%	58%	38%	39,962	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)					146,057	-	-	-	-	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost					$ 47,693	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost					3,069,049	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	86,636	138,372	136,099	138,122
Cumulative Total LCC						2,832	15,564	28,991	44,620	90,279	133,105	167,435	201,764	236,094	322,729	461,101	597,200	735,322
Total Cost (w/mgt reserve, & contingency)					4,041,891	6,467	28,576	29,918	34,170	92,160	85,693	66,292	66,292	66,292	124,966	179,539	168,943	168,048
Cumulative Total LCC						6,467	35,043	64,961	99,131	191,291	276,984	343,276	409,569	475,861	600,827	780,366	949,310	1,117,358
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost						6,467	27,424	27,555	30,202	78,176	69,760	51,791	49,704	47,700	86,294	118,982	107,447	102,570
Cumulative Discounted LCC					$ 2,104,492	$ 6,467	$ 33,891	$ 61,446	$ 91,648	$ 169,824	$ 239,584	$ 291,375	$ 341,079	$ 388,780	$ 475,074	$ 594,056	$ 701,504	$ 804,074

Treatment option 4a (LOW cost WIPP)-8Acre

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
							13	14	15	16	17	18	19	20	21	22	23	24
							1.432	1.472	1.513	1.556	1.599	1.644	1.690	1.737	1.786	1.836	1.887	1.940
										Operations								
										06/29/14-06/31/29								
Other Project Cost (OPC)		*min*	*mean*	*max*	expected value	Total Cost												
OPC																		
Conceptual Design, Project Mgt, & Permitting		36,651	56,647	76,643	56,647	56,647												
Testing and Start-up		13,572	20,977		20,977	20,977												
Total OPC (unescalated)			77,624			77,624	-								-			
plus escalation of			12,057			12,057	-								-			
plus contingency of			87,552			87,552												
Total OPC including escalation, mgt reserve, & contingency						177,233	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
TEC																		
ESH&Q		11,695	18,076	24,457	18,076	18,076												
Project mgt		8,166	12,621	17,076	12,621	12,621												
Construction, Equip, G&A & Procurement		106,863	165,166	223,470	165,166	165,166												
Total TEC (unescalated)			195,864			195,864												
plus escalation of			30,653			30,653												
plus contingency of			151,709			151,709												
Total TEC including escalation, mgt reserve, contingency						378,226	$ -	$ -	$ - 4	$ -	$ -		$ -	$ -	$ -	$ -	$ -	
						-												
Total Project Cost (TPC)						-												
TPC unescalated			273,488			273,488									-			
plus escalation of			42,710			42,710	-	-	-	-	-	-	-	-	-	-	-	-
plus contingency of			239,261			239,262	-	-	-	-	-	-	-	-	-	-	-	-
Total TPC including esc, mgt res, contingency			$ 555,459			555,459	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ - 5	$ -	$ -	$ -
discount factor @ OMB discount rate of		4.20%					1.707	1.779	1.854	1.931	2013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost						$ 442,687	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Operations	2080 hr-shif	*min*	*mean*	*max*	expected value													
Tangible Costs						2,745,513	141,906	145,796	149,795	153,906	158,132	162,476	166,942	171,533	176,253	181,104	186,092	191,219
Managerial		1,747	2,184	2,730	2,220	61,769	3,179	3,268	3,360	3,454	3,551	3,650	3,752	3,857	3,965	4,076	4,191	4,308
Supervision		20,218	25,272	31,590	25,693	714,751	36,790	37,820	38,879	39,968	41,087	42,237	43,420	44,636	45,885	47,170	48,491	49,849
Labor (Production)		22,772	28,465	35,581	28,939	805,051	41,438	42,598	43,791	45,017	46,277	47,573	48,905	50,275	51,682		54,617	56,146
(Maintenance)		6,365	7,072	10,254	7,485	208,897	10,717	11,017	11,326	11,643	11,969	12,304	12,648	13,003	13,367	13,741	14,126	14,521
Maintenance of Equipment		9,904	11,004	15,956	11,646	325,050	16,676	17,143	17,623	18,116	18,624	19,145	19,681	20,232	20,799	21,381	21,980	22,595
Propane		1,049	1,311	1,639	1,333	37,074	1,908	1,962	2,017	2,073	2,131	2,191	2,252	2,315	2,380	2,447	2,515	2,586
Grout		318	397	497	404	11,236	578	595	611	628	646	664	683	702	721	742	762	784
Consumables		12,334	15,418	19,272	15,675	436,050	22,445	23,073	23,719	24,383	25,066	25,768	26,489	27,231	27,993	28,777	29,583	30,411
Utilities(Power&Water)		1,520	1,899	2,374	1,931	53,719	2,765	2,842	2,922	3,004	3,088	3,174	3,263	3,355	3,449	3,545	3,644	3,747
STEAM		578	722	903	734	20,423	1,051	1,081	1,111	1,142	1,174	1,207	1,241	1,275	1,311	1,348	1,386	1,424
Disposal (m3)	1,605.9	183	229	287	233	6,486	334	343	353	363	373	383	394	405	416	428	440	452
Analytical		576	720	900	732	20,363	1,048	1,077	1,108	1,139	1,171	1,203	1,237	1,272	1,307	1,344	1,382	1,420
WIPP Disposal (m3)	716	4,684	5,855	7,318	5,952	44,642	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976
Operations subtotal						2,745,513	141,906			153,906	158,132	162,476	166,942	171,533	176,253	181,144	186,092	191,219
plus Operations Contingency @		5.0%	15.0%	45.0%	22%	594,861	30,746	31,589	32,456	33,346	34,262	35,203	36,171	37,166	38,188	39,239	40,320	41,431
Total Operations (w/contingency)						3,340,375	172,652	177,385	182,250	187,252	192,394	197,679	203,113	208,699	214,441	220,344	226,412	232,650
discount factor @ OMB discount rate of		4.20%					1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost						$ 1,614,113	$ 101,133	$ 99,717	$ 98,322	$ 96,949	$ 95,596	$ 94,263	$ 92,950	$ 91,657	$ 90,383	$ 89,127	$ 87,890	$ 86,672
		min	*mean*	*max*	expected value													
Post Operations																		
Decommission		6,564	8,205	10,256	8,341	8,341												
Decontamination/survellance		10,940	13,674	17,093	13,902	13,902												
Demolition		21,879	27,349	34,186	27,805	27,805												
Post-Operations Subtotal		39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-
plus Escalation						56,047	-	-	-	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @		15%	40%	58%	38%	39,962	-	-	-	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)						146,057	-	-	-	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of		4.20%					1.707	1.779	1.854	1.831	2013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost						$ 47,693	$ -	$ -	$ -	$ -	$	$ -	$ -	$ -	$ -	$ -	$ -	
Total Cost						3,069,049	141,906	145,796	149,795	153,906	158,132	162,476	166,942	171,533	176,253	181,104	186,092	191,219
Cumulative Total LCC							877,228	1,023,024	1,172,819	1,326,724	1,484,856	1,647,332	1,814,274	1,985,807	2,162,060	2,343,164	2,529,256	2,720,476
Total Cost (w/mgt reserve, & contingency)						4,041,891	172,652	177,385	182,250	187,252	192,394	197,679	203,113	208,699	214,441	220,344	226,412	232,650
Cumulative Total LCC							1,290,010	1,467,395	1,649,645	1,836,897	2,029,290	2,226,970	2,430,082	2,638,781	2,853,222	3,073,566	3,299,978	3,532,628
discount factor @ OMB discount rate of		4.20%					1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost							101,133	99,717	98,322	96,949	95,596	94,263	92,950	91,657	90,383	89,127	87,890	86,672
Cumulative Discounted LCC						$ 2,104,492	$ 905,206	$ 1,004,923	$ 1,103,246	$ 1,200,194	$ 1,295,790	$ 1,390,054	$ 1,483,004	$ 1,574,661	$ 1,665,044	$ 1,754,171	$ 1,842,061	$ 1,928,733

Treatment option 4a (HIGH cost WIPP)-8Acre

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

Other Project Cost (OPC)	min	mean	max	expected value	Total Cost	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
						0	1	2	3	4	5	6	7	8	9	10	11	12
						1.000	1.028	1.057	1.086	1.117	1.148	1.180	1.213	1.247	1.282	1.318	1.355	1.393
						Conceptual Design			Prelim Design	Final Design	Construction				Start-up			
						10/1/04-9/30/05			10/01/05-09/30/06	10/01/06-06/28/08	6/29/08-06/28/12				06/29/12-06/29/14			
OPC																		
Conceptual Design, Project Mgt, & Permitting	36,651	56,647	76,643	56,647	56,647	2,832	11,329	11,329	11,329	11,329	8,497							
Testing and Start-up	13,572	20,977	28,381	20,977	20,977										7,342	10,488	3,147	
Total OPC (unescalated)		77,624			77,624	2,832	11,329	11,329	11,329	11,329	8,497				7,342	10,488	3,147	
plus escalation of		12,057			12,057	440	1,760	1,760	1,760	1,760	1,320				1,140	1,629	489	
plus contingency of		87,552			87,552	3,195	12,778	12,778	12,778	12,778	9,584				8,281	11,830	3,549	
Total OPC including escalation, mgt reserve, & contingency					177,233	$ 6,467	$ 25,868	$ 25,868	$ 25,868	$ 25,868	$ 19,401	$ -	$ -	$ -	$ 16,763	$ 23,947	$ 7,184	$
TEC																		
ESH&Q	11,695	18,076	24,457	18,076	18,076			695	2,897	2,897	2,897	2,897	2,897	2,897				
Project mgt	8,166	12,821	17,076	12,621	12,621		1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402	1,402			
Construction, Equip, G&A & Procurement	106,863	165,166	223,470	165,166	165,166					30,030	30,030	30,030	30,030	30,030	15,015			
Total TEC (unescalated)		195,864			195,864	-	1,402	2,098	4,299	34,329	34,329	34,329	34,329	34,329	16,417	-		
plus escalation of		30,653			30,653	-	219	328	673	5,373	5,373	5,373	5,373	5,373	2,569	-		
plus contingency of		151,709			151,709	-	1,086	1,625	3,330	26,590	26,590	26,590	26,590	26,590	12,716	-		
Total TEC including escalation, mgt reserve, contingency					378,226	$ -	$ 2,708	$ 4,051	$ 8,302	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 66,292	$ 31,703	$ -	$ -	$
					-													
Total Project Cost (TPC)					-													
TPC unescalated		273,488			273,488	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	23,759	10,488	3,147	
plus escalation of		42,710			42,710	440	1,979	2,088	2,433	7,132	6,692	5,373	5,373	5,373	3.710	1,629	489	
plus contingency of		239,261			239,262	3,195	13,865	14,403	16,108	39,369	36,174	26,590	26,590	26,590	20,997	11,830	3,549	-
Total TPC including esc, mgt res, contingency		$ 555,459			555,459	$ 6,467	$ 28,576	$ 29,918	$ 34,170	$ 92,160	$ 85,693	$ 66,292	$ 66,292	$ 66,292	$ 48,466	$ 23,947	$ 7,184	$ -
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost					£ 442,687	$ 6,467	$ 27,424	$ 27,555	$ 30,202	$ 78,176	$ 69,760	$ 51,791	$ 49,704	$ 47,700	$ 33,468	$ 15,870	$ 4,569	$ -
Operations 2080 hr-shif	min	mean	max	expected value														
Tangible Costs					3,099,071	-	-	-	-	-	-	-	-	-	62,876	127,884	144,738	161,692
Managerial	1,747	2,184	2,730	2,220	61,769										1,423	2,927	3,009	3,093
Supervision	20,218	25,272	31,590	25,693	714,751										16,471	33,865	34,813	35,788
Labor (Production)	22,772	28,465	35,581	28,939	805,051										18,552	38,143	39,211	40,309
(Maintenance)	6,365	7,072	10,254	7,485	208,897										5,063	9,865	10,141	10,425
Maintenance of Equipment	9,904	11,004	15,956	11,646	325,050										7,878	15,350	15,780	16,222
Propane	1,049	1,311	1,639	1,333	37,074										854	1,757	1,806	1,856
Grout	318	397	497	404	11,236										259	532	547	563
Consumables	12,334	15,418	19,272	15,675	436,050										10,049	20,660	21,239	21,833
Utilities(Power&Water)	1,520	1,899	2,374	1,931	53,719										1,238	2,545	2,616	2,690
STEAM	578	722	903	734	20,423										471	968	995	1,023
Disposal (m3) 1,605.9	183	229	287	233	6,486										149	307	316	325
Analytical	576	720	900	732	20,363										469	965	992	1,020
WIPP Disposal (m3) 716	41,778	52,223	65,279	53,093	398,200												13,273	26,547
Operations subtotal					3,099,071	-	-	-	-	-	-	-	-	-	62,876	127,884	144,738	161,692
plus Operations Contingency @	5.0%	15.0%	45.0%	22%	671,465	-	-	-	-	-	-	-	-	-	13,623	27,708	31,360	35,033
Total Operations (w/contingency)					3,770,536	-	-	-	-	-	-	-	-	-	76,499	155,592	176,098	196,726
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost					$ 1,818,291	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 52,826	$ 103,112	$ 111,998	$ 120,074
	min	mean	max	expected value														
Post Operations																		
Decommission	6,564	8,205	10,256	8,341	8,341													
Decontamination/survellance	10,940	13,674	17,093	13,902	13,902													
Demolition	21,879	27,349	34,186	27,805	27,805													
Post-Operations Subtotal	39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-	-
plus Escalation					56,047	-	-	-	-	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @	15%	40%	58%	38%	39,962	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)					146,057	-	-	-	-	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost					$ 47,693	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Cost					3,422,607	2,832	12,732	13,427	15,629	45,659	42,827	34,329	34,329	34,329	86,636	138,372	147,884	161,692
Cumulative Total LCC						2,832	15,564	28,991	44,620	90,279	133,105	167,435	201,764	236,094	322,729	461,101	608,986	770,678
Total Cost (w/mgt reserve, & contingency)					4,472,052	6,467	28,576	29,918	34,170	92,160	85,693	66,292	66,292	66,292	124,966	179,539	183,282	196,726
Cumulative Total LCC						6,467	35,043	64,981	99,131	191,291	276,984	343,276	409,569	475,861	600,827	780,366	963,648	1,160,374
discount factor @ OMB discount rate of	4.20%					1.000	1.042	1.086	1.131	1.179	1.228	1.280	1.334	1.390	1.448	1.509	1.572	1.638
Discounted Annual Cost						6,467	27,424	27,555	30,202	78,176	69,760	51,791	49,704	47,700	86,294	118,982	$ 116,567	$ 120,074
Cumulative Discounted LCC					$ 2,308,670	$ 6,467	$ 33,891	$ 61,446	$ 91,648	$ 169,824	$ 239,584	$ 291,375	$ 341,079	$ 388,780	$ 475,074	$ 594,056	[illegible]	[illegible]

Treatment option 4a (HIGH cost WIPP)-8Acre

Life-Cycle Cost (LCC) Analysis

(ALL COST X1000)

Other Project Cost (OPC)	min	mean	max	expected value	Total Cost	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
						13	14	15	16	17	18	19	20	21	22	23	24
						1.432	1.472	1.513	1.556	1.599	1.644	1.690	1.737	1.786	1.836	1.887	1.940
									Operations								
									06/29/14-06/31/29								
OPC																	
Conceptual Design, Project Mgt, & Permitting	36,651	56,647	76,643	56,647	56,647												
Testing and Start-up	13,572	20,977	28,361	20,977	20,977												
Total OPC (unescalated)		77,624			77,624					-							
plus escalation of		12,057			12,057					-							
plus contingency of		87,552			87,552					-							
Total OPC including escalation, mgt reserve, & contingency					177,233	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
TEC																	
ESH&Q	11,695	18,076	24,457	18,076	18,076												
Project mgt	8,166	12,621	17,076	12,621	12,621												
Construction, Equip, G&A & Procurement	106,863	165,166	223,470	165,166	165,166												
Total TEC (unescalated)		195,864			195,864				-	-				-			
plus escalation of		30,653			30,653												
plus contingency of		151,709			151,709												
Total TEC including escalation, mgt reserve, contingency					378,226		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ -	
					-												
Total Project Cost (TPC)					-												
TPC unescalated		273,488			273,488												
plus escalation of		42,710			42,710												
plus contingency of		239,261			239,262												
Total TPC including esc, mgt res, contingency		$ 555,459			555,459	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$	$ -	$ -	$ -	
discount factor @ OMB discount rate of	4.20%					1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost					$ 442,687	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	

Operations	2080 hr-shif	min	mean	max	expected value	Total Cost	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Tangible Costs						3,099,071	165,476	169,366	173,365	177,476	181,702	186,047	190,513	195,104	199,823	204,675	209,663	214,790
Managerial		1,747	2,184	2,730	2,220	61,769	3,179	3,268	3,360	3,454	3,551	3,650	3,752	3,857	3,965	4,076	4,191	4,308
Supervision		20,218	25,272	31,590	25,693	714,751	36,790	37,820	38,879	39,968	41,087	42,237	43,420	44,636	45,885	47,170	48,491	49,849
Labor (Production)		22,772	28,465	35,581	28,939	805,051	41,438	42,598	43,791	45,017	46,277	47,573	48,905	50,275	51,682	53,129	54,617	56,146
(Maintenance)		6,365	7,072	10,254	7,485	208,897	10,717	11,017	11,326	11,643	11,969	12,304	12,648	13,003	13,367	13,741	14,126	14,521
Maintenance of Equipment		9,904	11,004	15,956	11,646	325,050	16,676	17,143	17,623	18,116	18,624	19,145	19,681	20,232	20,799	21,381	21,980	22,595
Propane		1,049	1,311	1,639	1,333	37,074	1,908	1,962	2,017	2,073	2,131	2,191	2,252	2,315	2,380	2,447	2,515	2,586
Grout		318	397	497	404	11,236	578	595	611	628	646	664	683	702	721	742	762	784
Consumables		12,334	15,418	19,272	15,675	436,050	22,445	23,073	23,719		25,066	25,768	26,489	27,231	27,993	28,777	29,583	30,411
Utilities(Power&Water)		1,520	1,899	2,374	1,931	53,719	2,765	2,842	2,922	3,004	3,088	3,174	3,263	3,355	3,449	3,545	3,644	3,747
STEAM		578	722	903	734	20,423	1,051	1,081	1,111	1,142	1,174	1,207	1,241	1,275	1,311	1,348	1,386	1,424
Disposal (m3)	1,605.9	183	229	287	233	6,486	334	343	353	363	373	383	394	405	416	428	440	452
Analytical		576	720	900	732	20,363	1,048	1,077	1,108	1,139	1,171	1,203	1,237	1,272	1,307	1,344	1,382	1,420
WIPP Disposal (m3)	716	41,778	52,223	65,279	53,093	398,200	26,547	26,547	26,547	26,547	26,547	26,547	26,547	26,547	26,547	26,547	26,547	26,547
Operations subtotal						3,099,071	165,476	169,366	173,365	177,476	181,702	186,047	190,513	195,104	199,823	204,675	209,663	214,790
plus Operations Contingency @		5.0%	15.0%	45.0%	22%	671,465	35,853	36,696	37,562	38,453	39,369	40,310	41,278	42,272	43,295	44,346	45,427	46,538
Total Operations (w/contingency)						3,770,536	201,329	206,062	210,928	215,929	221,071	226,357	231,790	237,376	243,118	249,021	255,089	261,328
discount factor @ OMB discount rate of		4.20%					1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost						$ 1,818,291	$ 117,931	$ 115,838	$ 113,794	$ 111,796	$ 109,845	$ 107,938	$ 106,074	$ 104,252	$ 102,470	$ 100,727	$ 99,023	$ 97,355

Post Operations	min	mean	max	expected value	Total Cost	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Decommission	6,564	8,205	10,256	8,341	8,341												
Decontamination/survellance	10,940	13,674	17,093	13,902	13,902												
Demolition	21,879	27,349	34,186	27,805	27,805												
Post-Operations Subtotal	39,382	49,228	61,535	50,048	50,048	-	-	-	-	-	-	-	-	-	-	-	-
plus Escalation					56,047	-	-	-	-	-	-	-	-	-	-	-	-
plus Post-Operations Contingency @	15%	40%	58%	38%	39,962	-	-	-	-	-	-	-	-	-	-	-	-
Total Post-Operations (w/ escalation & contingency)					146,057	-	-	-	-	-	-	-	-	-	-	-	-
discount factor @ OMB discount rate of	4.20%					1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost					$ 47,693	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$	$ -	$ -	

	Total Cost	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Total Cost	3,422,607	165,476	169,366	173,365	177,476	181,702	186,047	190,513	195,104	199,823	204,675	209,663	214,790
Cumulative Total LCC		936,154	1,105,520	1,278,886	1,456,362	1,638,064	1,824,111	2,014,623	2,209,727	2,409,550	2,614,225	2,823,887	3,038,677
Total Cost (w/mgt reserve, & contingency)	4,472,052	201,329	206,062	210,928	215,929	221,071	226,357	231,790	237,376	243,118	249,021	255,089	261,328
Cumulative Total LCC		1,361,703	1,567,766	1,778,693	1,994,623	2,215,694	2,442,050	2,673,841	2,911,217	3,154,335	3,403,356	3,658,445	3,919,773
discount factor @ OMB discount rate of		1.707	1.779	1.854	1.931	2.013	2.097	2.185	2.277	2.373	2.472	2.576	2.684
Discounted Annual Cost		117,931	115,838	113,794	111,796	109,845	107,938	106,074	104,252	102,470	100,727	99,023	97,355
Cumulative Discounted LCC	$ 2,308,670	$ 948,627	$ 1,064,465	$ 1,178,259	$ 1,290,055	$ 1,399,900	$ 1,507,838	$ 1,613,912	$ 1,718,164	$ 1,820,634	$ 1,921,361	$ 2,020,383	$ 2,117,739