

STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 5 - C-STD, PILOT, LOW SEISMIC

LIFE CYCLE COST SUMMARIES



Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

PILOT Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

Annual Escalation Factor 1.90%

Life Cycle Costs (40 Year Life)	Capital	Operations	Transport	Decommissioning	Escalation	Total Costs
Design & Construction	\$809,051,234					\$809,051,234
Operations & Maintenance (40 Year Life)		\$587,271,913				\$587,271,913
Cask Handling		\$38,508,689				\$38,508,689
Transportation Equipment	\$0					\$0
Transport Operations		\$0	\$0			\$0
Repackaging	\$0	\$0				\$0
Transport to Repository	\$0		\$0			\$0
D&D				\$92,867,444		<i>\$92,867,444</i>
Escalation					\$727,148,574	\$727,148,574
Total Costs (40 year Life)						\$2,254,847,853
Present Value						\$1,269,329,674
Life Circle Costs (OO Veer Life)			_	D	Escalation	Total Costs
Life Cycle Costs (80 Year Life)	Capital	Operations	Transport	Decommissioning	ESCAIALIOII	TOTAL COSTS
Design & Construction	Capital \$809,051,234	Operations	Transport	Decommissioning	ESCAIALIOII	\$809,051,234
	•	\$1,072,964,898	Transport	Decommissioning	ESCAIATION	
Design & Construction	•	·	Transport	Decommissioning	ESCAIACION	\$809,051,234
Design & Construction Operations & Maintenance (80 Year Life)	•	\$1,072,964,898	Transport	Decommissioning	ESCAIACION	\$809,051,234 \$1,072,964,898
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling	\$809,051,234	\$1,072,964,898	Transport \$0	Decommissioning	ESCAIACION	\$809,051,234 \$1,072,964,898 \$38,508,689
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment	\$809,051,234	\$1,072,964,898 \$38,508,689	·	Decommissioning	ESCAIACION	\$809,051,234 \$1,072,964,898 \$38,508,689 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations	\$809,051,234	\$1,072,964,898 \$38,508,689 \$0	·	Decommissioning	ESCAIACION	\$809,051,234 \$1,072,964,898 \$38,508,689 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging	\$809,051,234 \$0 \$0	\$1,072,964,898 \$38,508,689 \$0	\$0	\$92,867,444	ESCAIACION	\$809,051,234 \$1,072,964,898 \$38,508,689 \$0 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository	\$809,051,234 \$0 \$0	\$1,072,964,898 \$38,508,689 \$0	\$0	· ·	\$2,398,088,082	\$809,051,234 \$1,072,964,898 \$38,508,689 \$0 \$0 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository D&D	\$809,051,234 \$0 \$0	\$1,072,964,898 \$38,508,689 \$0	\$0	· ·		\$809,051,234 \$1,072,964,898 \$38,508,689 \$0 \$0 \$0 \$0 \$92,867,444



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 5 - C-STD, PILOT, LOW SEISMIC

CAPITAL COST SUMMARY

\$750,000



Interim Storage Facility

Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

PILOT Project - C-STD 60/40 Vertical/Horizontal - Low Seismic Separate

CHB

Level 3 Cost Summary - First of A kind module

Level 1	Level 2	Level 3 Descrij	ation	Level 3 Total
C-STD 01	LCVC1 Z	·	n Storage Facility and transportation Project	Level 5 Total
001201	C-STD 01.01		Pilot ISF Facility \$494,259,8	14
			,	
		C-STD 01.01.01	Storage Pads	\$0
		C-STD 01.01.02	Cask Handling (Transfer) Facility	\$135,175,719
		C-STD 01.01.03	Horizontal Dry Storage Modules	\$105,969,797
		C-STD 01.01.04	Vertical Dry Storage Module	\$93,975,136
		C-STD 01.01.05	Storage Cask Fabrication Facility	\$0
		C-STD 01.01.06	Cask Maintenance Facility	\$0
		C-STD 01.01.07	Concrete Batch Plant	\$1,850,000
		C-STD 01.01.08	Visitor Center/ Auditorium	\$0
		C-STD 01.01.09	Administration Building	\$3,140,000
		C-STD 01.01.10	Security	\$24,148,975
		C-STD 01.01.11	Rail Spur/ Receiving Yard	\$58,752,800
		C-STD 01.01.12	Utilities	\$18,682,150
		C-STD 01.01.13	Roads	\$18,212,737
		C-STD 01.01.14	Parking	\$735,000
		C-STD 01.01.15	Site Work	\$23,417,500
		C-STD 01.01.16	Warehouse	\$10,200,000
		C-STD 01.01.17	Maintenance Facility	\$0
		C-STD 01.01.18	Waste management Facility	\$0
		C-STD 01.01.01.xx	(Add Further Breakdown as needed)	\$0
	C-STD 01.02		Expanded Interim Storage Facility	\$0
		C-STD 01.02.01	Expanded Storage Pads and Dry Cask Storage Systems	\$0
		C-STD 01.02.02	Expanded Cask Handling Facility (if required)	\$0
		C-STD 01.02.03	Horizontal Dry Storage Modules	\$0
		C-STD 01.02.04	Vertical Dry Storage Casks	\$0
		C-STD 01.02.05	Storage Cask Fabrication Facility (Expanded)	\$0
		C-STD 01.02.06	Cask Maintenance Facility (Expanded)	\$0
		C-STD 01.02.07	Concrete Batch Plant (Expanded if needed)	\$0
		C-STD 01.02.08	Visitor Center/ Auditorium (expanded if needed)	\$0
		C-STD 01.02.09	Administration Building (Expanded if needed)	\$0
		C-STD 01.02.10	Security (Expanded)	\$0
		C-STD 01.02.11	Rail Spur/ Receiving Yard (Expanded)	\$0
		C-STD 01.02.12	Utilities Expanded as needed)	\$0
		C-STD 01.02.13	Roads (Expanded)	\$0
		C-STD 01.02.14	Parking (Expanded as needed)	\$0
		C-STD 01.02.15	Site Work (Expanded)	\$0 \$0
		C-STD 01.02.16	Warehouse (Expanded if Needed)	\$0 \$0
		C-STD 01.02.17	Maintenance Facility (Expanded if needed)	\$0 \$0
		C-STD 01.02.18	Waste management Facility (Expanded if needed)	\$0 \$0
		C-STD 01.02.19	Hot Cell / Laboratories	\$0 \$0
		C-STD 01.02.20	Pool Packaging Facility	\$0 \$0
		C-STD 01.02.21 C-STD 01.02.22	Standardized Storage System Standardized Disposal Canister	\$0 \$0
		C-STD 01.02.22	Canister Repackaging Facility (For Repository	\$0 \$0
	C-STD 01.03	C-31D 01.02.23		\$0
	0 010 01.00	C-STD 01.03.01	Transportation Casks	\$0 \$0
		C-STD 01.03.01	Rail Equipment	\$0 \$0
		C-STD 01.03.03	Rail Maintenance Facility	\$0
		C-STD 01.03.04	Transportation Systems Services	\$0
	C CTD 04 04		Dro Construction Conitalized Costs	100
	C-STD 01.04	C-STD 01.04.01	Pre-Construction Capitalized Costs \$60,265,0 Land or Land Leases	\$1,920,000
		C-STD 01.04.01	Site permits	\$1,920,000
		C-STD 01.04.02	Site Licensing	\$6,240,000
		C-STD 01.04.05	Plant Permits	\$0,240,000
		C CTD 04 04 06	Diagram and Alternative Ct. 45 c.	φο 4750 000

Planning and Alternative Studies

C-STD 01.04.06

Project Total



C-STD 01.09	C-STD 01.08.03 C-STD 01.08.04 C-STD 01.08.05 C-STD 01.08.xx	Interest Payments Indirect costs to support shipments to repository (Add Further Breakdown as needed) Project Contingencies \$108,573,975	\$0 \$0 \$0 \$0
	C-STD 01.08.04	·	\$0
	C-STD 01.08.02	Escalation Costs	\$33,356,060
C-STD 01.08	C-STD 01.07.02 C-STD 01.07.03 C-STD 01.07.04 C-STD 01.07.05	Decontamination Deconstruction Project Financial Costs \$82,772,445 Contractor Fees	\$0 \$0 \$0 \$0 \$0
C-STD 01.07	C-STD 01.06.01 C-STD 01.06.02 C-STD 01.07.01	Site Selection Public Information Process Decontamination and Deconstruction \$0 Decommissioning	\$0 \$0 \$0
C-STD 01.06	C-STD 01.05.07 C-STD 01.05.08 C-STD 01.05.09 C-STD 01.05.10 C-STD 01.05.11 C-STD 01.05.12 C-STD 01.05.13	Home office Engineering support to Construction Document Control Project Controls Construction Testing Inspections Startup and Testing Commissioning Site Selection \$0	\$7,200,000 \$2,700,000 \$3,600,000 \$2,700,000 \$3,600,000 \$3,000,000 \$3,000,000
C-STD 01.05	C-STD 01.05.01 C-STD 01.05.02 C-STD 01.05.03 C-STD 01.05.04 C-STD 01.05.05 C-STD 01.05.06	Indirect Capitalized Costs \$63,180,000 Project Management Construction Management Field indirect services Design Services in support of Construction QA/QC Commissioning and Startup	\$2,700,000 \$3,600,000 \$11,880,000 \$5,400,000 \$12,600,000 \$1,200,000
	C-STD 01.04.07 C-STD 01.04.08 C-STD 01.04.09 C-STD 01.04.10 C-STD 01.04.xx	Research and Development Design Other Pre-construction Costs Pre-construction contingencies (Add Further Breakdown as needed)	\$0 \$23,955,000 \$17,200,000 \$10,000,000 \$0

LCC

Escalation

All Capitol, Operation, Transportation,

\$809,051,234



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COST DETAILS

ALTERNATIVE 5 - C-STD, PILOT, LOW SEISMIC

LIFE CYCLE COST - 40 YEAR OPERATING LIFE



Discount Rate

Annual Escalation

Interim Storage Facility

Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

PILOT Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

								AIII	luai Escaiation			Disco	Juiit Nate
40 Year	Operating life								1.90%				3.00%
YEAR	Design/Const		O&M	Ca	ask Handling	ſ	D&D		Escalation	Ar	nual Expense		Cumulative
1	\$ 10,000,000	\$	-	\$	_	\$	_	\$	190,000	\$	10,190,000	\$	10,190,000
2	\$ 10,000,000	\$	_	\$	_	\$	_	\$	383,610	\$	10,383,610	\$	20,573,610
3	\$ 20,000,000	\$	_	\$	_	\$	_	\$	1,161,797	\$	21,161,797	\$	41,735,407
			_	•	_	•	_						
4	\$ 20,000,000	\$	-	\$	-	\$	-	\$	1,563,871	\$	21,563,871	\$	63,299,279
5	\$ 20,000,000	\$	-	\$	-	\$	-	\$	1,973,585	\$	21,973,585	\$	85,272,863
6	\$ 20,000,000	\$	-	\$	-	\$	-	\$	2,391,083	\$	22,391,083	\$	107,663,946
7	\$ 27,888,399	\$	-	\$	-	\$	-	\$	3,927,403	\$	31,815,802	\$	139,479,748
8	\$ 200,000,000	\$	-	\$	-	\$	-	\$	32,500,273	\$	232,500,273	\$	371,980,021
9	\$ 200,000,000	\$	28,996,032	\$	-	\$	-	\$	42,270,124	\$	271,266,156	\$	643,246,177
10	\$ 275,928,994	\$	26,860,352	\$	-	\$	-	\$	62,706,487	\$	365,495,833	\$	1,008,742,011
11		\$	27,383,172	\$ 1	12,836,230	\$	-	\$	9,251,706	\$	49,471,107	\$	1,058,213,118
12	\$ -	\$	27,383,172		12,836,230	\$	_	\$	10,191,657	\$	50,411,059	\$	1,108,624,177
13	\$ -	\$	27,383,172		12,836,230	\$		\$	11,149,467	\$	51,368,869	\$	1,159,993,045
					12,630,230		_	•					
14	\$ -	\$	12,142,325	\$	-	\$	-	\$	3,660,707	\$	15,803,032	\$	1,175,796,077
15	\$ -	\$	12,142,325	\$	-	\$	-	\$	3,960,965	\$	16,103,289	\$	1,191,899,367
16	\$ -	\$	12,142,325	\$	-	\$	-	\$	4,266,927	\$	16,409,252	\$	1,208,308,619
17	\$ -	\$	12,142,325	\$	-	\$	-	\$	4,578,703	\$	16,721,028	\$	1,225,029,647
18	\$ -	\$	12,142,325	\$	-	\$	-	\$	4,896,403	\$	17,038,727	\$	1,242,068,374
19	\$ -	\$	12,142,325	\$	-	\$	-	\$	5,220,138	\$	17,362,463	\$	1,259,430,837
20	\$ -	\$	12,142,325	\$	-	\$	-	\$	5,550,025	\$	17,692,350	\$	1,277,123,187
21	\$ -	\$	12,142,325	\$	-	\$	-	\$	5,886,180	\$	18,028,505	\$	1,295,151,691
22	\$ -	\$	12,142,325	\$	_	\$	_	\$	6,228,722	\$	18,371,046	\$	1,313,522,737
23	\$ -	\$	12,142,325	\$	_	\$	_	\$	6,577,771	\$	18,720,096	\$	1,332,242,834
24	A	\$	12,142,325	\$		ć		\$	6,933,453	\$	19,075,778		1,351,318,611
	\$ -				-	ې د	-	-				\$	
25	\$ -	\$	12,142,325	\$	-	\$	-	\$	7,295,893	\$	19,438,218	\$	1,370,756,829
26	\$ -	\$	12,142,325	\$	-	\$	-	\$	7,665,219	\$	19,807,544	\$	1,390,564,373
27	\$ -	\$	12,142,325	\$	-	\$	-	\$	8,041,562	\$	20,183,887	\$	1,410,748,260
28	\$ -	\$	12,142,325	\$	-	\$	-	\$	8,425,056	\$	20,567,381	\$	1,431,315,641
29	\$ -	\$	12,142,325	\$	-	\$	-	\$	8,815,837	\$	20,958,161	\$	1,452,273,802
30	\$ -	\$	12,142,325	\$	-	\$	-	\$	9,214,042	\$	21,356,366	\$	1,473,630,168
31	\$ -	\$	12,142,325	\$	-	\$	-	\$	9,619,813	\$	21,762,137	\$	1,495,392,305
32	\$ -	\$	12,142,325	\$	-	\$	-	\$	10,033,293	\$	22,175,618	\$	1,517,567,923
33	\$ -	\$	12,142,325	\$	-	\$	_	\$	10,454,630	\$	22,596,955	\$	1,540,164,878
34	\$ -	\$	12,142,325	\$	_	Ś	_	\$	10,883,972	\$	23,026,297	\$	1,563,191,174
35	\$ -	\$	12,142,325	\$	_	\$	_	\$	11,321,472	\$	23,463,796	\$	1,586,654,971
								•					
36	\$ -	\$	12,142,325	\$	-	\$	-	\$	11,767,284	\$	23,909,608	\$	1,610,564,579
37	\$ -	\$	12,142,325	\$	-	\$	-	\$	12,221,566	\$	24,363,891	\$	1,634,928,470
38	\$ -	\$	12,142,325	\$	-	\$	-	\$	12,684,480	\$	24,826,805	\$	1,659,755,275
39	\$ -	\$	12,142,325	\$	-	\$	-	\$	13,156,190	\$	25,298,514	\$	1,685,053,789
40	\$ -	\$	12,142,325	\$	-	\$	-	\$	13,636,861	\$	25,779,186	\$	1,710,832,975
41	\$ -	\$	12,142,325	\$	-	\$	-	\$	14,126,666	\$	26,268,991	\$	1,737,101,966
42	\$ -	\$	12,142,325	\$	-	\$	-	\$	14,625,777	\$	26,768,101	\$	1,763,870,067
43	\$ -	\$	12,142,325	\$	-	\$	-	\$	15,134,371	\$	27,276,695	\$	1,791,146,762
44	\$ -	\$	12,142,325	\$	-	\$	-	\$	15,652,628	\$	27,794,952		1,818,941,715
-	•	•	, =,===	r		•		•	-, -, 3-3	r	,,	7	, -,,



45	\$	-	\$ 12,142,325	\$ - \$		-	\$ 16,180,732	\$ 28,323,057	\$ 1,847,264,771
46	\$	-	\$ 12,142,325	\$ - \$		-	\$ 16,718,870	\$ 28,861,195	\$ 1,876,125,966
47	\$	-	\$ 12,142,325	\$ - \$		-	\$ 17,267,233	\$ 29,409,557	\$ 1,905,535,523
48	\$	-	\$ 12,142,325	\$ - \$		-	\$ 17,826,014	\$ 29,968,339	\$ 1,935,503,862
49	\$	-	\$ 12,142,325	\$ - \$		-	\$ 18,395,413	\$ 30,537,737	\$ 1,966,041,600
50	\$	-	\$ 12,142,325	\$ - \$		-	\$ 18,975,630	\$ 31,117,954	\$ 1,997,159,554
51	\$	-	\$ -	\$ - \$	21,17	5,000	\$ 34,122,666	\$ 55,297,666	\$ 2,052,457,220
52	\$	-	\$ -	\$ - \$	20,00	0,000	\$ 33,221,556	\$ 53,221,556	\$ 2,105,678,776
53	\$	-	\$ -	\$ - \$	17,23	0,815	\$ 29,492,921	\$ 46,723,736	\$ 2,152,402,512
54	\$	-	\$ -	\$ - \$	17,23	0,815	\$ 30,380,672	\$ 47,611,487	\$ 2,200,013,999
55	\$	-	\$ -	\$ - \$	17,23	0,815	\$ 31,285,291	\$ 48,516,105	\$ 2,248,530,104
56	\$	-	\$ -	\$ - \$		-	\$ -	\$ -	\$ 2,248,530,104
57	\$	-	\$ -	\$ - \$		-	\$ -	\$ -	\$ 2,248,530,104
58	\$	-	\$ -	\$ - \$		-	\$ -	\$ -	\$ 2,248,530,104
59	\$	-	\$ -	\$ - \$		-	\$ -	\$ -	\$ 2,248,530,104
60	\$	-	\$ -	\$ - \$		-	\$ -	\$ -	\$ 2,248,530,104
		Total	Total		Tot	al	Total		Total
	De	esign/Const	0&M		D&	.D	Escalation		Life Cycle
	\$	803,817,393	\$ 587,271,913	\$ 38,508,689 \$	92,86	7,444	\$ 726,064,666		\$ 2,248,530,104



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 5 - C-STD, PILOT, LOW SEISMIC

LIFE CYCLE COST - 80 YEAR OPERATING LIFE



Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

PILOT Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

80 Year Operating Life

80 Yea	r Op	erating Life								Δnn	nual Escalation		Discount Rate
										AIII	1.90%		3.00%
												Annual	
YEAR		esign/Const			O&M		Cask Handling		D&D		Escalation	Funding	Cumulative
1	\$	10,000,000	ç		-	\$	-	\$	-	\$	190,000	\$10,190,000	\$10,190,000
2	\$	10,000,000	(5	-	Ş	-	\$	-	\$	383,610	\$10,383,610	\$20,573,610
3	Ş _	20,000,000	7	5	-	Ş	-	\$	-	\$	1,161,797	\$21,161,797	\$41,735,407
4	Ş _	20,000,000	7	5	-	Ş	-	\$	-	\$	1,563,871	\$21,563,871	\$63,299,279
5	\$	20,000,000	7	5	-	Ş	-	\$	-	\$	1,973,585	\$21,973,585	\$85,272,863
6	\$,	20,000,000	7	5	-	Ş	-	\$	-	\$	2,391,083	\$22,391,083	\$107,663,946
7	Ş -	27,888,399	7	5	-	Ş	-	\$ •	-	\$	3,927,403	\$31,815,802	\$139,479,748
8	\$ \$	200,000,000	(-	\$	-	\$	-	\$	32,500,273	\$232,500,273	\$371,980,021
9	\$ \$	200,000,000	(28,996,032	\$ \$	-	\$	-	\$	42,270,124	\$271,266,156	\$643,246,177
10	\$	275,928,994			26,860,352	\$ \$	-	\$	-	\$	62,706,487	\$365,495,833	\$1,008,742,011
11					27,383,172	\$	12,836,230	\$	-	\$	9,251,706	\$49,471,107	\$1,058,213,118
12	\$	-	(27,383,172	\$	12,836,230	\$	-	\$	10,191,657	\$50,411,059	\$1,108,624,177
13	\$	-	(27,383,172	\$ \$	12,836,230	\$	-	\$	11,149,467	\$51,368,869	\$1,159,993,045
14	\$	-			12,142,325	\$	-	\$	-	\$	3,660,707	\$15,803,032	\$1,175,796,077
15	Ş -	-	ç		12,142,325	\$	-	\$ •	-	\$	3,960,965	\$16,103,289	\$1,191,899,367
16	Ş -	-	ç		12,142,325	\$	-	\$ •	-	\$	4,266,927	\$16,409,252	\$1,208,308,619
17	Ş -	-	ç		12,142,325	\$	-	\$ •	-	\$	4,578,703	\$16,721,028	\$1,225,029,647
18	\$,	-	ç		12,142,325	\$	-	\$	-	\$	4,896,403	\$17,038,727	\$1,242,068,374
19	\$,	-	ç		12,142,325	\$	-	\$	-	\$	5,220,138	\$17,362,463	\$1,259,430,837
20	\$,	-	ç		12,142,325	\$	-	\$	-	\$	5,550,025	\$17,692,350	\$1,277,123,187
21	\$,	-	ç		12,142,325	\$	-	\$	-	\$	5,886,180	\$18,028,505	\$1,295,151,691
22	\$,	-	ç		12,142,325	\$	-	\$	-	\$	6,228,722	\$18,371,046	\$1,313,522,737
23	\$,	-	ç		12,142,325	\$	-	\$	-	\$	6,577,771	\$18,720,096	\$1,332,242,834
24	\$,	-	ç	5	12,142,325	\$	-	\$	-	\$	6,933,453	\$19,075,778	\$1,351,318,611
25	Ş -	-	7	5	12,142,325	Ş	-	\$ •	-	\$ •	7,295,893	\$19,438,218	\$1,370,756,829
26	Ş -	-	7	5	12,142,325	Ş	-	\$ •	-	\$ •	7,665,219	\$19,807,544	
27	Ş -	-	7	5	12,142,325	Ş	-	\$ •	-	\$ •	8,041,562	\$20,183,887	\$1,410,748,260
28	\$	-	,	>	12,142,325	\$	-	\$	-	\$	8,425,056	\$20,567,381	\$1,431,315,641
29	\$	-	,	>	12,142,325	\$	-	\$	-	\$	8,815,837	\$20,958,161	\$1,452,273,802
30	\$	-	,	>	12,142,325	\$	-	\$	-	\$	9,214,042	\$21,356,366	\$1,473,630,168
31	\$ \$	-	7	,	12,142,325	\$ \$	-	\$	-	\$	9,619,813	\$21,762,137	\$1,495,392,305
32	\$ \$	-	7	,	12,142,325	\$ \$	-	\$	-	\$	10,033,293	\$22,175,618	\$1,517,567,923
33	\$ \$	-	7	,	12,142,325	\$ \$	-	\$	-	\$	10,454,630	\$22,596,955	\$1,540,164,878
34	\$ ¢	-	7	,	12,142,325	<u>></u>	-	\$ ¢	-	\$ ¢	10,883,972	\$23,026,297	\$1,563,191,174
35	\$ ¢	-	7	,	12,142,325	<u>></u>	-	\$ ¢	-	\$ ¢	11,321,472	\$23,463,796	\$1,586,654,971
36	۶ ۲	-	7	,	12,142,325	<u>ک</u>	-	>	-	>	11,767,284	\$23,909,608	\$1,610,564,579
37	۶ ۲	-	7	,	12,142,325	<u>ک</u>	-	>	-	>	12,221,566	\$24,363,891	\$1,634,928,470
38	۶ ۲	-	7	,	12,142,325	<u>ک</u>	-	>	-	>	12,684,480	\$24,826,805	\$1,659,755,275
39	\$ ¢	-	7	,	12,142,325	<u>></u>	-	\$ ¢	-	\$ ¢	13,156,190	\$25,298,514	\$1,685,053,789
40	۶ ۲	-	7	,	12,142,325	<u>ک</u>	-	>	-	>	13,636,861	\$25,779,186	\$1,710,832,975
41	۶ ۲	-	7		12,142,325	<u>ک</u>	-	ب	-	ب	14,126,666	\$26,268,991	\$1,737,101,966
42	۶ ۲	-	7		12,142,325	<u>ک</u>	-	ب	-	ب	14,625,777	\$26,768,101	\$1,763,870,067
43	۶ ۲	-	7	,	12,142,325	<u>ک</u>	-	ب	-	ب	15,134,371	\$27,276,695	\$1,791,146,762
44 45	ې د	-	7	,	12,142,325	ر ک	-	ې د	-	۶ د	15,652,628	\$27,794,952	\$1,818,941,715
45 46	ې د	-	7	,	12,142,325	ر ک	-	ې د	-	۶ د	16,180,732	\$28,323,057	\$1,847,264,771
46	\$ ¢	-	7	,	12,142,325	<u>></u>	-	\$ ¢	-	\$ ¢	16,718,870	\$28,861,195	\$1,876,125,966
47	\$ ¢	-	7	,	12,142,325	<u>></u>	-	\$ ¢	-	\$ ¢	17,267,233	\$29,409,557	\$1,905,535,523
48	ې د	-	7	,	12,142,325	ر ک	-	ې د	-	۶ د	17,826,014	\$29,968,339	\$1,935,503,862
49	۶ ک	-	÷	,	12,142,325	<u>ک</u>	-	>	-	>	18,395,413	\$30,537,737	\$1,966,041,600
50 51	ې د	-	7	,	12,142,325	٠ ۲	-	<u>></u>	-	\$ *	18,975,630	\$31,117,954	\$1,997,159,554
51	ې د	-	7	,	12,142,325	٠ ۲	-	<u>></u>	-	\$ *	19,566,871	\$31,709,196	\$2,028,868,750
52 52	ې د	-	7	,	12,142,325	٠ ۲	-	<u>></u>	-	\$ *	20,169,346	\$32,311,670	\$2,061,180,420
53 54	<u>></u>	-	7		12,142,325	<u>۲</u>	-	\$ ^	-	\$ ^	20,783,267	\$32,925,592	\$2,094,106,012
54 55	<u>></u>	-	7		12,142,325	<u>۲</u>	-	\$ ^	-	\$ ^	21,408,854	\$33,551,178	\$2,127,657,190
55 50	<u>></u>	-	,	,	12,142,325	\$	-	\$	-	\$ ^	22,046,326	\$34,188,651	\$2,161,845,841
56	<u>></u>	-	,	,	12,142,325	\$	-	\$	-	\$ ^	22,695,910	\$34,838,235	
57 50	<u>></u>	-	,	,	12,142,325	\$	-	\$	-	\$	23,357,837	\$35,500,161	\$2,232,184,237
58 50	<u>></u>	-	<u> </u>		12,142,325	\$	-	\$ ^	-	\$	24,032,340	\$36,174,665	\$2,268,358,902
59	Þ	-	Ç	>	12,142,325	\$	-	\$	-	\$	24,719,659	\$36,861,983	\$2,305,220,885



60	\$ -	\$ 12,142,325	\$ -	\$ -	\$	25,420,036	\$37,562,361	\$2,342,783,246
61	\$ -	\$ 12,142,325	\$ -	\$ -	\$	26,133,721	\$38,276,046	\$2,381,059,291
62	\$ -	\$ 12,142,325	\$ -	\$ -	\$	26,860,966	\$39,003,291	\$2,420,062,582
63	\$ -	\$ 12,142,325	\$ -	\$ -	\$	27,602,028	\$39,744,353	\$2,459,806,935
64	\$ -	\$ 12,142,325	\$ -	\$ -	\$	28,357,171	\$40,499,496	\$2,500,306,431
65	\$0	\$ 12,142,325	\$ -	\$ -	\$	29,126,662	\$41,268,986	\$2,541,575,417
66	\$0	\$ 12,142,325	\$ -	\$ -	\$	29,910,772	\$42,053,097	\$2,583,628,514
67	\$0	\$ 12,142,325	\$ -	\$ -	\$	30,709,781	\$42,852,106	\$2,626,480,619
68	\$0	\$ 12,142,325	\$ -	\$ -	\$	31,523,971	\$43,666,296	\$2,670,146,915
69	\$0	\$ 12,142,325	\$ -	\$ -	\$	32,353,631	\$44,495,955	\$2,714,642,871
70	\$0	\$ 12,142,325	\$ -	\$ -	\$	33,199,054	\$45,341,379	\$2,759,984,249
71	\$0	\$ 12,142,325	\$ -	\$ -	\$	34,060,540	\$46,202,865	\$2,806,187,114
72	\$0	\$ 12,142,325	\$ -	\$ -	\$	34,938,395	\$47,080,719	\$2,853,267,833
73	\$0	\$ 12,142,325	\$ -	\$ -	\$	35,832,928	\$47,975,253	\$2,901,243,086
74	\$0	\$ 12,142,325	\$ -	\$ -	\$	36,744,458	\$48,886,783	\$2,950,129,868
75	\$0	\$ 12,142,325	\$ -	\$ -	\$	37,673,307	\$49,815,631	\$2,999,945,500
76	\$0	\$ 12,142,325	\$ -	\$ -	\$	38,619,804	\$50,762,128	\$3,050,707,628
77	\$0	\$ 12,142,325	\$ -	\$ -	\$	39,584,284	\$51,726,609	\$3,102,434,237
78	\$0	\$ 12,142,325	\$ -	\$ -	\$	40,567,090	\$52,709,415	\$3,155,143,652
79	\$0	\$ 12,142,325	\$ -	\$ -	\$	41,568,569	\$53,710,893	\$3,208,854,545
80	\$0	\$ 12,142,325	\$ -	\$ -	\$	42,589,076	\$54,731,400	\$3,263,585,946
81	\$0	\$ 12,142,325	\$ -	\$ -	\$	43,628,972	\$55,771,297	\$3,319,357,243
82	\$0	\$ 12,142,325	\$ -	\$ -	\$	44,688,627	\$56,830,952	\$3,376,188,194
83	\$0	\$ 12,142,325	\$ -	\$ -	\$	45,768,415	\$57,910,740	\$3,434,098,934
84	\$0	\$ 12,142,325	\$ -	\$ -	\$	46,868,719	\$59,011,044	\$3,493,109,978
85	\$0	\$ 12,142,325	\$ -	\$ -	\$	47,989,929	\$60,132,254	\$3,553,242,231
86	\$0	\$ 12,142,325	\$ -	\$ -	\$	49,132,442	\$61,274,766	\$3,614,516,998
87	\$0	\$ 12,142,325	\$ -	\$ -	\$	50,296,662	\$62,438,987	\$3,676,955,985
88	\$0	\$ 12,142,325	\$ -	\$ -	\$	51,483,003	\$63,625,328	\$3,740,581,312
89	\$0	\$ 12,142,325	\$ -	\$ -	\$	52,691,884	\$64,834,209	\$3,805,415,521
90	\$0	\$ 12,142,325	\$ -	\$ -	\$	53,923,734	\$66,066,059	\$3,871,481,580
91			\$ -	\$ 21,175,000	\$	96,226,640	\$117,401,640	\$3,988,883,220
92			\$ -	\$ 20,000,000	\$	92,993,881	\$112,993,881	\$4,101,877,101
93			\$ -	\$ 17,230,815	\$	81,967,643	\$99,198,458	\$4,201,075,559
94			\$ -	\$ 17,230,815	\$	83,852,414	\$101,083,228	\$4,302,158,787
95			\$ -	\$ 17,230,815	\$	85,772,995	\$103,003,810	\$4,405,162,597
96				\$ -	\$	-	\$0	\$4,405,162,597
97				\$ -	\$	-	\$0	\$4,405,162,597
98					\$	-	\$0	\$4,405,162,597
99					\$	-	\$0	\$4,405,162,597
100					\$	-	\$0	\$4,405,162,597
	Total	Total	Total	Total		Total		Total
	Design/Const	0&M	Handling	D&D		Escalation		Life Cycle
	¢002 017 202	 1 072 064 000	 20 500 600	CO2 067 444	•	2 207 004 174		¢4.40E.463.E07

\$92,867,444

\$38,508,689

\$2,397,004,174

\$4,405,162,597

\$1,072,964,898

\$803,817,393



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 6 - C-STD, PILOT, HIGH SEISMIC

LIFE CYCLE COST SUMMARIES

Design & Construction



Total Costs

\$892,297,051

\$1,414,260,349

Escalation

TASK ORDER NO. 16 – GENERIC DESIGN ALTERNATIVES FOR DRY STORAGE OF USED NUCLEAR FUEL THE DEPARTMENT OF ENERGY – OFFICE OF NUCLEAR ENERGY

Project: C-STD Pilot (5,000 MTU)

Life Cycle Costs (40 Year Life)

PILOT Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

Present Value

Annual Escalation Factor 1.90% Discount Rate 3.40%

Capital

\$892,297,051

Operations & Maintenance (40 Year Life)		<i>\$573,923,753</i>				<i>\$573,923,753</i>
Cask Handling		\$38,508,689				\$38,508,689
Transportation Equipment	\$0					\$0
Transport Operations		\$0	\$0			\$0
Repackaging	\$0	\$0				\$0
Transport to Repository	\$0		\$0			\$0
D&D				\$105,181,959		\$105,181,959
Escalation					\$762,720,508	\$762,720,508
Total Costs (40 year Life)						\$2,372,631,958
Present Value						\$1,259,884,758
Life Cycle Costs (80 Year Life)	Capital	Operations	Transport	Decommissioning	Escalation	Total Costs
Design & Construction	\$892,297,051					\$892,297,051
Operations & Maintenance (80 Year Life)		\$1,059,616,738				\$1,059,616,738
Cask Handling		\$38,508,689				\$38,508,689
Transportation Equipment	\$0					\$0
Transport Operations		\$0	\$0			\$0
Repackaging	\$0	\$0				\$0
Transport to Repository	\$0		\$0			\$0
D&D				\$105,181,959		\$105,181,959
Escalation					\$2,471,879,702	\$2,471,879,702
Total Costs (80 Year Life)						\$4,567,484,138

Operations

Transport

Decommissioning



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 6 - C-STD, PILOT, HIGH SEISMIC

CAPITAL COST SUMMARY



Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

PILOT Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

Level 3 Cost Summary - First of A kind module

	,					
Level 1	Level 2	Level 3	Description			Level 3 Total
C-STD LE 01			Interim Stor	age Facility and transportation Project		
	C-STD LE 01.01		Pilo	t ISF Facility	\$552,057,398	
		C CTD F 04 C	14 04	Character CTDs		ćo
		C-STD LE 01.0		Storage STDs		\$0
		C-STD LE 01.0		Cask Handling (Transfer) Facility		\$163,293,960
		C-STD LE 01.0		Horizontal Dry Storage Modules		\$123,041,942
		C-STD LE 01.0		Vertical Dry Storage Module		\$106,582,334
		C-STD LE 01.0		Storage Cask Fabrication Facility		\$0 \$0
		C-STD LE 01.0		Cask Maintenance Facility Concrete Batch Plant		\$0
		C-STD LE 01.0				\$1,850,000
		C-STD LE 01.0		Visitor Center/ Auditorium		\$0 \$3,140,000
		C-STD LE 01.0		Administration Building Security		\$3,140,000
		C-STD LE 01.0		Rail Spur/ Receiving Yard		\$58,752,800
		C-STD LE 01.0		Utilities		\$18,682,150
		C-STD LE 01.0		Roads		\$18,212,737
		C-STD LE 01.0		Parking		\$735,000
		C-STD LE 01.0		Site Work		\$23,417,500
		C-STD LE 01.0		Warehouse		\$10,200,000
		C-STD LE 01.0		Maintenance Facility		\$0
		C-STD LE 01.0		Waste management Facility		\$0
		C-STD LE				, ,
		01.01.01.xx		(Add Further Breakdown as needed)		\$0
	C-STD LE 01.02		Evn	anded Interim Storage Facility	\$0	
	C 31D LL 01.02	C-STD LE 01.0	•	Expanded Storage STDs and Dry Cask Storage Syste		\$0
		C-STD LE 01.0		Expanded Cask Handling Facility (if required)		\$0
		C-STD LE 01.0		Horizontal Dry Storage Modules		\$0
		C-STD LE 01.0		Vertical Dry Storage Casks		\$0
		C-STD LE 01.0		Storage Cask Fabrication Facility (Expanded)		\$0
		C-STD LE 01.0		Cask Maintenance Facility (Expanded)		\$0
		C-STD LE 01.0		Concrete Batch Plant (Expanded if needed)		\$0
		C-STD LE 01.0		Visitor Center/ Auditorium (expanded if needed)		, \$0
		C-STD LE 01.0	2.09	Administration Building (Expanded if needed)		\$0
		C-STD LE 01.0		Security (Expanded)		\$0
		C-STD LE 01.0	2.11	Rail Spur/ Receiving Yard (Expanded)		\$0
		C-STD LE 01.0	2.12	Utilities Expanded as needed)		\$0
		C-STD LE 01.0	2.13	Roads (Expanded)		\$0
		C-STD LE 01.0	2.14	Parking (Expanded as needed)		\$0
		C-STD LE 01.0	2.15	Site Work (Expanded)		\$0
		C-STD LE 01.0	2.16	Warehouse (Expanded if Needed)		\$0
		C-STD LE 01.0	2.17	Maintenance Facility (Expanded if needed)		\$0
		C-STD LE 01.0	2.18	Waste management Facility (Expanded if needed)		\$0
		C-STD LE 01.0	2.19	Hot Cell / Laboratories		\$0
		C-STD LE 01.0	2.20	Pool Packaging Facility		\$0
		C-STD LE 01.0	2.21	Standardized Storage System		\$0
		C-STD LE 01.0)2.22	Standardized Disposal Canister		\$0
		C-STD LE 01.0	2.23	Canister Repackaging Facility (For Repository		\$0
	C-STD LE 01.03		Trar	nsportation Equipment	\$0	
		C-STD LE 01.0		Transportation Casks		\$0
		C-STD LE 01.0		Rail Equipment		\$0
		C-STD LE 01.0		Rail Maintenance Facility		\$0 \$0
		C-STD LE 01.0	13.04	Transportation Systems Services		\$0
	C-STD LE 01.04		Pre-	-Construction Capitalized Costs	\$66,025,000	
		C-STD LE 01.0	04.01	Land or Land Leases		\$7,680,000
		C-STD LE 01.0	04.02	Site permits		\$200,000
		C-STD LE 01.0		Site Licensing		\$6,240,000
		C-STD LE 01.0		Plant Permits		\$0
		C-STD LE 01.0	04.06	Planning and Alternative Studies		\$750,000

Project Total



	C-STD LE 01.04.07	Research and Development	\$0
	C-STD LE 01.04.08	Design	\$23,955,000
	C-STD LE 01.04.09	Other Pre-construction Costs	\$17,200,000
	C-STD LE 01.04.10	Pre-construction contingencies	\$10,000,000
	C-STD LE 01.04.xx	(Add Further Breakdown as needed)	\$0
C-STD LE 01.05	C 312 LL 01.0 1.AX	Indirect Capitalized Costs \$63,180,000	Ģ0
C 312 LL 01.03	C-STD LE 01.05.01	Project Management	\$2,700,000
	C-STD LE 01.05.02	Construction Management	\$3,600,000
	C-STD LE 01.05.03	Field indirect services	\$11,880,000
	C-STD LE 01.05.04	Design Services in support of Construction	\$5,400,000
	C-STD LE 01.05.05	QA/QC	\$12,600,000
	C-STD LE 01.05.06	Commissioning and Startup	\$1,200,000
	C-STD LE 01.05.07	Home office Engineering support to Construction	\$7,200,000
	C-STD LE 01.05.08	Document Control	\$2,700,000
	C-STD LE 01.05.09	Project Controls	\$3,600,000
	C-STD LE 01.05.10	Construction Testing	\$2,700,000
	C-STD LE 01.05.11	Inspections	\$3,600,000
	C-STD LE 01.05.12	Startup and Testing	\$3,000,000
	C-STD LE 01.05.13	Commissioning	\$3,000,000
C-STD LE 01.06	C 31D LL 01.03.13	Site Selection \$0	73,000,000
C 31D LL 01.00	C-STD LE 01.06.01	Site Selection 50	\$0
	C-STD LE 01.06.02	Public Information Process	\$0 \$0
C-STD LE 01.07	C 31D LL 01.00.02	Decontamination and Deconstruction \$0	ŞO
C 31D LL 01.07	C-STD LE 01.07.01	Decommissioning	\$0
	C-STD LE 01.07.02	Decontamination	\$0 \$0
	C-STD LE 01.07.03	Deconstruction	\$0 \$0
	C-STD LE 01.07.04	Deconstruction	\$0 \$0
	C-STD LE 01.07.05		\$0
C-STD LE 01.08	C 31D LL 01.07.03	Project Financial Costs \$91,289,161	ŞO
C 31D LL 01.00	C-STD LE 01.08.01	Contractor Fees	\$54,500,992
	C-STD LE 01.08.02	Escalation Costs	\$36,788,169
	C-STD LE 01.08.03	Interest Payments	\$30,788,183
	C-STD LE 01.08.04	Indirect costs to support shipments to repository	\$0 \$0
	C-STD LE 01.08.05	maneet costs to support simplificates to repository	\$0
	C-STD LE 01.08.xx	(Add Further Breakdown as needed)	\$0
	C 312 LL 01.00.AX	(Add Farther Breakdown as needed)	Ģ0
C-STD LE 01.09		Project Contingencies \$119,745,492	
C 31D LL 01.03	C-STD LE 01.09.01	Management Reserve - Contractor Held	\$38,627,578
	C-STD LE 01.09.02	Contingency - DOE held	\$81,117,914
	0 0 1 0 1 0 1 1 0 1 1 0 1	contingency Doz neta	ΨΟΞ/ΞΞ///
C-STD LE 01.10			
2 3.2 22 01.10	C-STD LE 01.10.01	Other Direct Costs \$0	
	C-STD LE 01.10.02	DOE Project Operations	\$0
	C-STD LE 01.10.03	DOE TM&E	\$0
	C-STD LE 01.10.04	Host site Operational Costs Miscellaneous	\$ 0
	C-STD LE 01.10.05	Miscellaneous ODC	\$0
			, ,
C-STD LE 01.11		Operational Costs 0	
· -	C-STD LE 01.11.01	Operations Costs	\$0
	C-STD LE 01.11.02	Transportation Costs	\$0
	C-STD LE 01.11.03	Escalation (Operations/Transportation)	\$0
			·
		TEC (All Direct & indirect Costs, MR, Escalation)	\$811,179,137
		TPC (TEC plus Contingency, ODCs)	\$892,297,051
		All Capitol, Operation, Transportation,	4
		LCC Escalation	\$892,297,051



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 6 - C-STD, PILOT, HIGH SEISMIC

LIFE CYCLE COST - 40 YEAR OPERATING LIFE

Life Cycle

\$ 2,338,228,063



Interim Storage Facility

Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

Design/Const

\$ 892,297,051

O&M

\$ 555,460,877

PILOT Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

Separa	ite C	гив							۸nı	nual Escalation			Dic	count Rate
40 Yea	r Op	perating life							AIII	1.90%			פוט	3.40%
					_						_			
YEAR		Design/Const		O&M	C	ask Handling		D&D		Escalation		inual Expense		Cumulative
1	\$	10,000,000	\$	-	\$	-	\$	-	\$	190,000	\$	10,190,000	\$	10,190,000
2	Ş	10,000,000	\$	-	\$ •	-	\$	-	\$ •	383,610	\$	10,383,610	\$	20,573,610
3	Ş	20,000,000	\$	-	\$	-	\$	-	\$	1,161,797	\$	21,161,797	\$	41,735,407
4	Ş	20,000,000	\$	-	\$	-	\$	-	\$	1,563,871	\$	21,563,871	\$	63,299,279
5	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,973,585	\$	21,973,585	\$	85,272,863
6	\$	20,000,000	\$	-	\$	-	\$	-	\$	2,391,083	\$	22,391,083	\$	107,663,946
7	\$	27,888,399	\$	-	\$	-	\$	-	\$	3,927,403	\$	31,815,802	\$	139,479,748
8	\$	200,000,000	\$	-	\$	-	\$	-	\$	32,500,273	\$	232,500,273	\$	371,980,021
9	\$	200,000,000	\$	28,996,032	\$	-	\$	-	\$	42,270,124	\$	271,266,156	\$	643,246,177
10	\$	364,408,652	\$	26,860,352	\$	-	\$	-	\$	81,030,277	\$	472,299,281	\$	1,115,545,458
11			\$	22,933,786	\$	12,836,230	\$	-	\$	8,228,209	\$	43,998,224	\$	1,159,543,683
12	\$	-	\$	22,933,786	\$	12,836,230	\$	-	\$	9,064,175	\$	44,834,191	\$	1,204,377,874
13	\$	-	\$	22,933,786	\$	12,836,230	\$	-	\$	9,916,025	\$	45,686,040	\$	1,250,063,914
14	\$	-	\$	11,643,328	\$	-	\$	-	\$	3,510,268	\$	15,153,596	\$	1,265,217,510
15	\$	-	\$	11,643,328	\$	-	\$	-	\$	3,798,186	\$	15,441,514	\$	1,280,659,024
16	\$	-	\$	11,643,328	\$	-	\$	-	\$	4,091,575	\$	15,734,903	\$	1,296,393,928
17	\$	-	\$	11,643,328	\$	-	\$	-	\$	4,390,538	\$	16,033,866	\$	1,312,427,794
18	\$	-	\$	11,643,328	\$	-	\$	-	\$	4,695,182	\$	16,338,510	\$	1,328,766,304
19	\$	-	\$	11,643,328	\$	-	\$	-	\$	5,005,614	\$	16,648,942	\$	1,345,415,245
20	\$	-	\$	11,643,328	\$	-	\$	-	\$	5,321,943	\$	16,965,271	\$	1,362,380,517
21	\$	-	\$	11,643,328	\$	-	\$	-	\$	5,644,284	\$	17,287,612	\$	1,379,668,128
22	\$	_	\$	11,643,328	\$	-	\$	_	\$	5,972,748	\$	17,616,076	\$	1,397,284,204
23	Ś	_	Ś	11,643,328	Ś	_	Ś	_	Ś	6,307,454	\$	17,950,782	Ś	1,415,234,986
24	ς .	_	ς ,	11,643,328	ς ς	_	ς ς	_	ς ς	6,648,518	\$	18,291,846	ς ,	1,433,526,833
25	ب خ	_	ċ	11,643,328	ب خ	_	ب خ	_	ب خ	6,996,064		18,639,392	ب خ	
	ې خ	-	ې د		<u>ب</u>	-	ې خ	-	<u>ب</u>		\$ ¢		\$	1,452,166,224
26	γ	-	۶ خ	11,643,328	Ş	-	Ş	-	ې خ	7,350,212	\$	18,993,540	, ,	1,471,159,764
27	\$ \$	-	\$	11,643,328	\$	-	\$	-	\$	7,711,089	\$	19,354,417	\$	1,490,514,181
28	\$	-	\$	11,643,328	\$	-	\$	-	\$	8,078,823	Ş	19,722,151	\$	1,510,236,333
29	\$	-	\$	11,643,328	\$	-	\$	-	\$	8,453,544	\$	20,096,872	\$	1,530,333,205
30	\$	-	\$	11,643,328	\$	-	\$	-	\$	8,835,385	\$	20,478,713	\$	1,550,811,917
31	\$	-	\$	11,643,328	\$	-	\$	-	\$	9,224,480	\$	20,867,808	\$	1,571,679,726
32	\$	-	\$	11,643,328	\$	-	\$	-	\$	9,620,969	\$	21,264,297	\$	1,592,944,022
33	\$	-	\$	11,643,328	\$	-	\$	-	\$	10,024,990	\$	21,668,318	\$	1,614,612,340
34	\$	-	\$	11,643,328	\$	-	\$	-	\$	10,436,688	\$	22,080,016	\$	1,636,692,356
35	\$	-	\$	11,643,328	\$	-	\$	-	\$	10,856,209	\$	22,499,537	\$	1,659,191,893
36	\$	-	\$	11,643,328	\$	-	\$	-	\$	11,283,700	\$	22,927,028	\$	1,682,118,921
37	\$	-	\$	11,643,328	\$	-	\$	-	\$	11,719,313	\$	23,362,641	\$	1,705,481,562
38	\$	-	\$	11,643,328	\$	-	\$	-	\$	12,163,203	\$	23,806,531	\$	1,729,288,093
39	\$	-	\$	11,643,328	\$	-	\$	-	\$	12,615,528	\$	24,258,856	\$	1,753,546,949
40	\$	-	\$	11,643,328	\$	-	\$	-	\$	13,076,446	\$	24,719,774	\$	1,778,266,723
41	\$	_	\$	11,643,328	\$	-	\$	-	\$	13,546,121	\$	25,189,449	\$	1,803,456,172
42	\$	_	Ś	11,643,328	\$	_	Ś	_	\$	14,024,721	\$	25,668,049	\$	1,829,124,221
43	\$	_	\$	11,643,328	\$	_	\$	_	\$	14,512,414	\$	26,155,742	\$	1,855,279,963
44	ς ,	_	ς ,	11,643,328	ς ς	_	ς ς	_	ς ς	15,009,373	\$	26,652,701	ς ,	1,881,932,664
45	ç	_	¢	11,643,328	¢	_	¢	_	¢	15,515,774	\$	27,159,102	¢	1,909,091,767
	ر ک	_	ب خ		ب خ	_	ب خ	_	ب خ				ب	
46	ې ک	-	ې د	11,643,328	ې خ	-	ې د	-	ې د	16,031,797	\$ ¢	27,675,125	ر ک	1,936,766,892
47	<u>۲</u>	-	>	11,643,328	\$ \$	-	>	-	\$ \$	16,557,625	\$	28,200,953	<u>۲</u>	1,964,967,845
48	\$	-	\$	11,643,328	\$	-	\$	-	\$	17,093,443	\$ •	28,736,771	\$	1,993,704,615
49	\$	-	\$	11,643,328	\$	-	\$	-	\$	17,639,441	\$	29,282,769	\$	2,022,987,385
50	\$	-	\$	11,643,328	\$	-	\$	-	\$	18,195,814	\$	29,839,142	\$	2,052,826,527
51	\$	-	\$	-	\$	-	\$	21,175,000	\$	34,122,666	\$	55,297,666	\$	2,108,124,193
52	\$	-	\$	-	\$	-	\$	20,000,000	\$	33,221,556	\$	53,221,556	\$	2,161,345,749
53	\$	-	\$	-	\$	-	\$	21,335,653	\$	36,518,920	\$	57,854,573	\$	2,219,200,321
54	\$	-	\$	-	\$	-	\$	21,335,653	\$	37,618,157	\$	58,953,810	\$	2,278,154,131
55	\$	-	\$	-	\$	-	\$	21,335,653	\$	38,738,279	\$	60,073,932	\$	2,338,228,063
56	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,338,228,063
57	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,338,228,063
58	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,338,228,063
59	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,338,228,063
60	\$	-	, \$	-	\$	-	, \$	-	\$	-	\$	-	\$	2,338,228,063
	•		•		•		•		•		•		•	
		Total		Total				Total		Total				Total
		Decign/Const		08.14				D&D		Escalation				Life Cycle

\$ 38,508,689

D&D

\$ 105,181,959

Escalation

746,779,488



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 6 - C-STD, PILOT, HIGH SEISMIC

LIFE CYCLE COST - 80 YEAR OPERATING LIFE



Pilot Storage Facility (5,000 MTU)

Project: C-STD Pilot (5,000 MTU)

PILOT Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

80 Year Operating Life

60 Tea	ı Ol	Jerating Life							Anr	nual Escalation		Discount Rate
										1.90%		3.40%
											Annual	
YEAR		Design/Const		O&M		Cask Handling		D&D		Escalation	Funding	Cumulative
1	\$	10,000,000	\$	-	\$	-	\$	-	\$	190,000	\$10,190,000	\$10,190,000
2	\$	10,000,000	\$	-	\$	-	\$	-	\$	383,610	\$10,383,610	\$20,573,610
3	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,161,797	\$21,161,797	\$41,735,407
4	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,563,871	\$21,563,871	\$63,299,279
5	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,973,585	\$21,973,585	\$85,272,863
6	\$	20,000,000	\$	-	\$	-	\$	-	\$	2,391,083	\$22,391,083	\$107,663,946
7	\$	27,888,399	\$	-	\$	-	\$	-	\$	3,927,403	\$31,815,802	\$139,479,748
8	\$	200,000,000	\$	-	\$	-	\$	-	\$	32,500,273	\$232,500,273	\$371,980,021
9	\$	200,000,000	\$	28,996,032	\$	-	\$	-	\$	42,270,124	\$271,266,156	\$643,246,177
10	\$	364,408,652	\$	26,860,352	\$	-	\$	-	\$	81,030,277	\$472,299,281	\$1,115,545,458
11			\$	22,933,786	\$	12,836,230	\$	-	\$	8,228,209	\$43,998,224	\$1,159,543,683
12	\$	-	\$	22,933,786	\$	12,836,230	\$	-	\$	9,064,175	\$44,834,191	\$1,204,377,874
13	\$	-	\$	22,933,786	\$	12,836,230	\$	-	\$	9,916,025	\$45,686,040	\$1,250,063,914
14	\$	-	\$	12,142,325	\$	-	\$	-	\$	3,660,707	\$15,803,032	\$1,265,866,946
15	Ş	-	\$	12,142,325	\$,	-	\$	-	\$	3,960,965	\$16,103,289	\$1,281,970,235
16	\$	-	\$	12,142,325	\$	-	\$	-	\$	4,266,927	\$16,409,252	\$1,298,379,487
17	\$	-	\$	12,142,325	\$	-	\$	-	\$	4,578,703	\$16,721,028	\$1,315,100,515
18	Ş	-	\$	12,142,325	\$	-	\$	-	\$	4,896,403	\$17,038,727	\$1,332,139,242
19	\$	-	\$	12,142,325	\$	-	\$	-	\$	5,220,138	\$17,362,463	\$1,349,501,705
20	\$	-	\$	12,142,325	\$	-	\$	-	\$	5,550,025	\$17,692,350	\$1,367,194,055
21	Ş	-	\$	12,142,325	\$	-	\$	-	\$	5,886,180	\$18,028,505	\$1,385,222,560
22	Ş	-	\$	12,142,325	Ş	-	\$	-	\$	6,228,722	\$18,371,046	\$1,403,593,606
23	Ş	-	\$	12,142,325	Ş	-	\$	-	\$	6,577,771	\$18,720,096	\$1,422,313,702
24	Ş	-	\$	12,142,325	Ş	-	\$	-	Ş	6,933,453	\$19,075,778	\$1,441,389,480
25	Ş	-	\$	12,142,325	Ş	-	\$	-	Ş	7,295,893	\$19,438,218	\$1,460,827,697
26	\$	-	\$	12,142,325	\$	-	\$	-	\$ •	7,665,219	\$19,807,544	\$1,480,635,241
27	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,041,562	\$20,183,887	\$1,500,819,128
28	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,425,056	\$20,567,381	\$1,521,386,509
29	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$	8,815,837	\$20,958,161	\$1,542,344,670
30	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	9,214,042	\$21,356,366	\$1,563,701,036
31	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	9,619,813	\$21,762,137	\$1,585,463,174
32	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	10,033,293	\$22,175,618	\$1,607,638,791
33	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	10,454,630	\$22,596,955	\$1,630,235,746
34	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	10,883,972	\$23,026,297	\$1,653,262,043
35	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	11,321,472	\$23,463,796	\$1,676,725,839
36	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	11,767,284	\$23,909,608	\$1,700,635,447
37	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	12,221,566	\$24,363,891	\$1,724,999,338
38	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	12,684,480	\$24,826,805	\$1,749,826,143
39	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	13,156,190	\$25,298,514	\$1,775,124,658
40	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	13,636,861	\$25,779,186	\$1,800,903,844
41	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	14,126,666	\$26,268,991	\$1,827,172,834
42	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	14,625,777	\$26,768,101	\$1,853,940,935
43	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	15,134,371	\$27,276,695	\$1,881,217,631
44	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	15,652,628	\$27,794,952	\$1,909,012,583
45	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	16,180,732	\$28,323,057	\$1,937,335,640
46	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	16,718,870	\$28,861,195	\$1,966,196,834
47	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$ \$	17,267,233	\$29,409,557	\$1,995,606,392
48	\$ \$	-	\$	12,142,325	\$	-	\$ \$	-	\$ \$	17,826,014	\$29,968,339	\$2,025,574,731
49	\$ \$	-	\$	12,142,325	\$	-	\$ \$	-	\$ \$	18,395,413	\$30,537,737	\$2,056,112,468
50	\$ ^	-	\$ •	12,142,325	\$ •	-	\$ •	-	\$ ¢	18,975,630	\$31,117,954	\$2,087,230,422
51	\$	-	\$	12,142,325	\$	-	\$	-	\$	19,566,871	\$31,709,196	\$2,118,939,618
52 52	\$ ^	-	\$ •	12,142,325	\$ •	-	\$ •	-	\$ ¢	20,169,346	\$32,311,670	\$2,151,251,288
53 54	\$ ^	-	\$ •	12,142,325	\$ •	-	\$ •	-	\$ ¢	20,783,267	\$32,925,592	\$2,184,176,880
54	\$ ^	-	\$ •	12,142,325	\$ •	-	\$ •	-	\$ ¢	21,408,854	\$33,551,178	\$2,217,728,058
55 50	\$ ^	-	\$ •	12,142,325	\$ •	-	\$ •	-	\$ ¢	22,046,326	\$34,188,651	
56	\$ ^	-	\$	12,142,325	\$	-	\$ •	-	\$	22,695,910		\$2,286,754,944
57 50	<u>></u>	-	\$	12,142,325	\$	-	\$	-	\$	23,357,837	\$35,500,161	\$2,322,255,105
58	>	-	\$	12,142,325	\$	-	\$	-	\$	24,032,340	\$36,174,665	\$2,358,429,770

\$892,297,051

\$1,059,616,738

\$38,508,689

\$105,181,959

\$2,471,879,702

\$4,567,484,138



	Design/Const		O&M	Cask Handl	ing	D&D	Escalation		Life Cycle
	Total		Total	Total		Total	Total		Total
100							\$ -	\$0	\$4,567,484,138
99							\$ -	\$0	\$4,567,484,138
98							\$ -	\$0	\$4,567,484,138
97						\$ -	\$ -	\$0	\$4,567,484,138
96						\$ -	\$ -	\$0	\$4,567,484,138
95				\$	-	\$ 21,335,653	\$ 106,206,404	\$127,542,057	\$4,567,484,138
94				\$	-	\$ 21,335,653	\$ 103,828,290	\$125,163,942	\$4,439,942,081
93				\$	-	\$ 21,335,653	\$ 101,494,516	\$122,830,169	\$4,314,778,138
92				\$	-	\$ 20,000,000	\$ 92,993,881	\$112,993,881	\$4,191,947,969
91				\$	-	\$ 21,175,000	\$ 96,226,640	\$117,401,640	\$4,078,954,088
90	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 53,923,734	\$66,066,059	\$3,961,552,448
89	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 52,691,884	\$64,834,209	\$3,895,486,390
88	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 51,483,003	\$63,625,328	\$3,830,652,181
87	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 50,296,662	\$62,438,987	\$3,767,026,853
86	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 49,132,442	\$61,274,766	\$3,704,587,866
85	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 47,989,929	\$60,132,254	\$3,643,313,100
84	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 46,868,719	\$59,011,044	\$3,583,180,846
83	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 45,768,415	\$57,910,740	\$3,524,169,802
82	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 44,688,627	\$56,830,952	\$3,466,259,063
81	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 43,628,972	\$55,771,297	\$3,409,428,111
80	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 42,589,076	\$54,731,400	\$3,353,656,814
79	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 41,568,569	\$53,710,893	\$3,298,925,414
78	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 40,567,090	\$52,709,415	\$3,245,214,520
77	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 39,584,284	\$51,726,609	\$3,192,505,106
76	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 38,619,804	\$50,762,128	\$3,140,778,497
75	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 37,673,307	\$49,815,631	\$3,090,016,368
74	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 36,744,458	\$48,886,783	\$3,040,200,737
73	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 35,832,928	\$47,975,253	\$2,991,313,954
72	\$0	0	\$ 12,142,325	\$	-	\$ -	\$ 34,938,395	\$47,080,719	\$2,943,338,701
71	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 34,060,540	\$46,202,865	\$2,896,257,982
70	\$(0	\$ 12,142,325	\$	-	\$ -	\$ 33,199,054	\$45,341,379	\$2,850,055,117
69	\$(\$ 12,142,325	\$	-	\$ -	\$ 32,353,631	\$44,495,955	\$2,804,713,739
68	\$(\$ 12,142,325	\$	-	\$ -	\$ 31,523,971	\$43,666,296	\$2,760,217,784
67	\$(\$ 12,142,325	\$	-	\$ -	\$ 30,709,781	\$42,852,106	\$2,716,551,488
66	\$(\$ 12,142,325	\$	-	\$ -	\$ 29,910,772	\$42,053,097	\$2,673,699,382
65	\$(\$ 12,142,325	\$	-	\$ -	\$ 29,126,662	\$41,268,986	\$2,631,646,285
64	\$ -		\$ 12,142,325	\$	-	\$ -	\$ 28,357,171	\$40,499,496	\$2,590,377,299
63	\$ -		\$ 12,142,325	\$	-	\$ -	\$ 27,602,028	\$39,744,353	\$2,549,877,803
62	\$ -		\$ 12,142,325	\$	_	\$ -	\$ 26,860,966	\$39,003,291	\$2,510,133,450
61	\$ -		\$ 12,142,325	\$	_	\$ -	\$ 26,133,721	\$38,276,046	\$2,471,130,160
60	\$ -		\$ 12,142,325	\$	_	\$ _	\$ 25,420,036	\$37,562,361	\$2,432,854,114
59	\$ -		\$ 12,142,325	\$	_	\$ _	\$ 24,719,659	\$36,861,983	\$2,395,291,753



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 7 - C-STD, EXPANDED, LOW SEISMIC

LIFE CYCLE COST SUMMARIES



Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Expanded Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

Annual Escalation Factor 1.90% Discount Rate 3.40%

Life Cycle Costs (40 Year Life)	Capital	Operations	Transport	Decommissioning	Escalation	Total Costs
Design & Construction	\$1,153,181,855					\$1,153,181,855
Operations & Maintenance (40 Year Life)		\$587,271,913				\$587,271,913
Cask Handling		\$77,017,378				\$77,017,378
Transportation Equipment	\$0					\$0
Transport Operations		\$0	\$0			\$0
Repackaging	\$0	\$0				\$0
Transport to Repository	\$0		\$0			\$0
D&D				\$163,700,287		\$163,700,287
Escalation					\$935,257,337	\$935,257,337
Total Costs (40 year Life)						\$2,916,428,769
Present Value						\$1,554,102,012
						<i>+</i> = <i>y</i> = 0 = 1, = 0 = 1
Life Cycle Costs (80 Year Life)	Capital	Operations	Transport	Decommissioning	Escalation	Total Costs
	•	Operations	Transport	Decommissioning	Escalation	
Life Cycle Costs (80 Year Life) Design & Construction Operations & Maintenance (80 Year Life)	Capital \$1,153,181,855		Transport	Decommissioning	Escalation	Total Costs \$1,153,181,855 \$1,072,964,898
Design & Construction	•	\$1,072,964,898	Transport	Decommissioning	Escalation	\$1,153,181,855 \$1,072,964,898
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling	•		Transport	Decommissioning	Escalation	\$1,153,181,855
Design & Construction Operations & Maintenance (80 Year Life)	\$1,153,181,855	\$1,072,964,898	Transport \$0	Decommissioning	Escalation	\$1,153,181,855 \$1,072,964,898 \$77,017,378
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment	\$1,153,181,855	\$1,072,964,898 \$77,017,378	·	Decommissioning	Escalation	\$1,153,181,855 \$1,072,964,898 \$77,017,378 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations	\$1,153,181,855 \$0	\$1,072,964,898 \$77,017,378 \$0	·	Decommissioning	Escalation	\$1,153,181,855 \$1,072,964,898 \$77,017,378 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging	\$1,153,181,855 \$0 \$0	\$1,072,964,898 \$77,017,378 \$0	\$0	Decommissioning \$163,700,287	Escalation	\$1,153,181,855 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository	\$1,153,181,855 \$0 \$0	\$1,072,964,898 \$77,017,378 \$0	\$0		Escalation \$2,825,316,883	\$1,153,181,855 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository D&D Escalation	\$1,153,181,855 \$0 \$0	\$1,072,964,898 \$77,017,378 \$0	\$0			\$1,153,181,855 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0 \$0 \$0 \$163,700,287 \$2,825,316,883
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository D&D	\$1,153,181,855 \$0 \$0	\$1,072,964,898 \$77,017,378 \$0	\$0			\$1,153,181,855 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0 \$0 \$0 \$163,700,287



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 7 - C-STD, EXPANDED, LOW SEISMIC

CAPITAL COST SUMMARY



Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Expanded Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

Level 3 Cost Summary - First of A kind module

Level 1	Level 2	Level 3	Description	To Facility and transportation Draiget		Level 3 Total
C-STD EX 01	C-STD EX 01.01			ge Facility and transportation Project ISF Facility	\$509,394,563	
	C-31D EX 01.01		PIIOL	ist facility	\$509,394,563	
		C-STD EX 01.	01.01	Storage STDs		\$0
		C-STD EX 01.	01.02	Cask Handling (Transfer) Facility		\$135,175,719
		C-STD EX 01.	01.03	Horizontal Dry Storage Modules		\$117,986,923
		C-STD EX 01.	01.04	Vertical Dry Storage Module		\$97,092,759
		C-STD EX 01.	01.05	Storage Cask Fabrication Facility		\$0
		C-STD EX 01.	01.06	Cask Maintenance Facility		\$0
		C-STD EX 01.		Concrete Batch Plant		\$1,850,000
		C-STD EX 01.		Visitor Center/ Auditorium		\$0
		C-STD EX 01.		Administration Building		\$3,140,000
		C-STD EX 01.		Security		\$24,148,975
		C-STD EX 01. C-STD EX 01.		Rail Spur/ Receiving Yard Utilities		\$58,752,800 \$18,682,150
		C-STD EX 01.		Roads		\$18,212,737
		C-STD EX 01.		Parking		\$735,000
		C-STD EX 01.		Site Work		\$23,417,500
		C-STD EX 01.		Warehouse		\$10,200,000
		C-STD EX 01.		Maintenance Facility		\$0,200,000
		C-STD EX 01.		Waste management Facility		\$0
		C-STD EX		,		·
		01.01.01.xx		(Add Further Breakdown as needed)		\$0
	C-STD EX 01.02		Fynar	nded Interim Storage Facility	\$241,846,512	
	C 31D LX 01.02	C-STD EX 01.	•	Expanded Storage STDs and Dry Cask Storage Syste		\$0
		C-STD EX 01.		Expanded Cask Handling Facility (if required)	C1113	\$0
		C-STD EX 01.		Horizontal Dry Storage Modules		\$117,986,923
		C-STD EX 01.		Vertical Dry Storage Casks		\$96,592,759
		C-STD EX 01.		Storage Cask Fabrication Facility (Expanded)		\$0
		C-STD EX 01.	02.06	Cask Maintenance Facility (Expanded)		\$0
		C-STD EX 01.	02.07	Concrete Batch Plant (Expanded if needed)		\$1,850,000
		C-STD EX 01.	02.08	Visitor Center/ Auditorium (expanded if needed)		\$745,000
		C-STD EX 01.	02.09	Administration Building (Expanded if needed)		\$0
		C-STD EX 01.	02.10	Security (Expanded)		\$10,074,488
		C-STD EX 01.	02.11	Rail Spur/ Receiving Yard (Expanded)		\$0
		C-STD EX 01.		Utilities Expanded as needed)		\$3,624,200
		C-STD EX 01.		Roads (Expanded)		\$83,142
		C-STD EX 01.		Parking (Expanded as needed)		\$0
		C-STD EX 01.		Site Work (Expanded)		\$10,890,000
		C-STD EX 01.		Warehouse (Expanded if Needed)		\$0 \$0
		C-STD EX 01. C-STD EX 01.		Maintenance Facility (Expanded if needed)		\$0 \$0
		C-STD EX 01.		Waste management Facility (Expanded if needed) Hot Cell / Laboratories		\$0 \$0
		C-STD EX 01.		Pool Packaging Facility		\$0 \$0
		C-STD EX 01.		Standardized Storage System		\$0 \$0
		C-STD EX 01.		Standardized Disposal Canister		\$0
		C-STD EX 01.		Canister Repackaging Facility (For Repository		\$0
	C-STD EX 01.03			portation Equipment	\$0	, -
		C-STD EX 01.		Transportation Casks	•	\$0
		C-STD EX 01.	03.02	Rail Equipment		\$0
		C-STD EX 01.	03.03	Rail Maintenance Facility		\$0
		C-STD EX 01.	03.04	Transportation Systems Services		\$0
	C-STD EX 01.04			Construction Capitalized Costs Land or Land Leases	\$66,025,000	\$7,680,000
		(CCID LV M	()/[()1			
		C-STD EX 01.				
		C-STD EX 01.	04.02	Site permits		\$200,000
			04.02 04.03			

Project Total



TASK ORDER NO. 16 - GENERIC DESIGN ALTERNATIVES FOR DRY STORAGE OF USED NUCLEAR FUEL THE DEPARTMENT OF ENERGY - OFFICE OF NUCLEAR ENERGY

	C-STD EX 01.04.07	Research and Development		\$0
	C-STD EX 01.04.08	Design		\$23,955,000
	C-STD EX 01.04.09	Other Pre-construction Costs		\$17,200,000
	C-STD EX 01.04.10	Pre-construction contingencies		\$10,000,000
	C-STD EX 01.04.xx	(Add Further Breakdown as needed)		\$0
C-STD EX 01.05		Indirect Capitalized Costs	\$63,180,000	
	C-STD EX 01.05.01	Project Management		\$2,700,000
	C-STD EX 01.05.02	Construction Management		\$3,600,000
	C-STD EX 01.05.03	Field indirect services		\$11,880,000
	C-STD EX 01.05.04	Design Services in support of Construction		\$5,400,000
	C-STD EX 01.05.05	QA/QC		\$12,600,000
	C-STD EX 01.05.06	Commissioning and Startup		\$1,200,000
	C-STD EX 01.05.07	Home office Engineering support to Construction		\$7,200,000
	C-STD EX 01.05.08	Document Control		\$2,700,000
	C-STD EX 01.05.09	Project Controls		\$3,600,000
	C-STD EX 01.05.10	Construction Testing		\$2,700,000
	C-STD EX 01.05.11	Inspections		\$3,600,000
	C-STD EX 01.05.12	Startup and Testing		\$3,000,000
	C-STD EX 01.05.12	Commissioning		\$3,000,000
C-STD EX 01.06	C 31D LX 01.03.13	Site Selection	\$0	73,000,000
C-31D LX 01.00	C-STD EX 01.06.01	Site Selection	ŞU	\$0
	C-STD EX 01.06.02	Public Information Process		\$0 \$0
C CTD EV 01 07	C-31D EX 01.00.02	Decontamination and Deconstruction	ćo	Ş U
C-STD EX 01.07	C CTD EV 04 07 04		\$0	ćo
	C-STD EX 01.07.01	Decommissioning		\$0 \$0
	C-STD EX 01.07.02	Decontamination		\$0
	C-STD EX 01.07.03	Deconstruction		\$0
	C-STD EX 01.07.04			\$0
	C-STD EX 01.07.05		4	\$0
C-STD EX 01.08		Project Financial Costs	\$117,979,774	4
	C-STD EX 01.08.01	Contractor Fees		\$70,435,686 ·
	C-STD EX 01.08.02	Escalation Costs		\$47,544,088
	C-STD EX 01.08.03	Interest Payments		\$0
	C-STD EX 01.08.04	Indirect costs to support shipments to repository		\$0
	C-STD EX 01.08.05			\$0
	C-STD EX 01.08.xx	(Add Further Breakdown as needed)		\$0
C-STD EX 01.09		Project Contingencies	\$154,756,006	
	C-STD EX 01.09.01	Management Reserve - Contractor Held		\$49,921,292
	C-STD EX 01.09.02	Contingency - DOE held		\$104,834,714
C-STD EX 01.10				
	C-STD EX 01.10.01	Other Direct Costs	\$0	4 -
	C-STD EX 01.10.02	DOE Project Operations		\$0
	C-STD EX 01.10.03	DOE TM&E		\$0
	C-STD EX 01.10.04	Host site Operational Costs Miscellaneous		\$0
	C-STD EX 01.10.05	Miscellaneous ODC		\$0
C-STD EX 01.11		Operational Costs	0	1-
	C-STD EX 01.11.01	Operations Costs		\$0
	C-STD EX 01.11.02	Transportation Costs		\$0
	C-STD EX 01.11.03	Escalation (Operations/Transportation)		\$0
		TEC (All Direct & indirect Costs, MR,	, Escalation)	\$1,048,347,141
		TPC (TEC plus Contingency, ODCs)	,	\$1,153,181,855
		All Capitol, Operation, Transpor	rtation,	· · ·
		LCC Escalation		\$1,153,181,855



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 7 - C-STD, EXPANDED, LOW SEISMIC

LIFE CYCLE COST - 40 YEAR OPERATING LIFE



Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

\$ 1,153,181,855

\$ 544,611,815 \$ 77,017,378

Expanded Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

Separa 40 Yea		erating life							Anı	nual Escalation 1.90%			Dis	count Rate 3.40%
YEAR	_	Design/Const		O&M	C	ask Handling		D&D		Escalation	۸'n	ınual Expense		Cumulative
1	\$	10,000,000	\$	- JOHN	\$	ask Hariuiiig	\$	DQD	\$	190,000	\$	10,190,000	\$	10,190,000
2	\$	10,000,000	\$	_	¢	_	ċ	_	¢	383,610	\$	10,383,610	\$	20,573,610
3	۶ \$	20,000,000	ې د	_	ې د	_	ې د	_	ب خ	1,161,797		21,161,797	۶ \$	
	-		ې د	-	ې د	-	ې د	-	ې خ		\$			41,735,407
4	\$	20,000,000	\$ \$	-	\$ \$	-	\$ \$	-	\$ \$	1,563,871	\$	21,563,871	\$	63,299,279
5	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,973,585	\$	21,973,585	\$	85,272,863
6	\$	20,000,000	\$	-	\$	-	\$	-	\$	2,391,083	\$	22,391,083	\$	107,663,946
7	\$	27,888,399	\$	-	\$	-	\$	-	\$	3,927,403	\$	31,815,802	\$	139,479,748
8	\$	200,000,000	\$	-	\$	-	\$	-	\$	32,500,273	\$	232,500,273	\$	371,980,021
9	\$	200,000,000	\$	22,503,661	\$	-	\$	-	\$	41,071,704	\$	263,575,365	\$	635,555,387
10	\$	625,293,456	\$	22,503,661	\$	-	\$	-	\$	134,156,244	\$	781,953,361	\$	1,417,508,748
11			\$	22,933,786	\$	12,836,230	\$	-	\$	8,228,209	\$	43,998,224	\$	1,461,506,972
12	\$	-	\$	22,933,786	\$	12,836,230	\$	-	\$	9,064,175	\$	44,834,191	\$	1,506,341,163
13	\$	-	\$	22,933,786	\$	12,836,230	\$	-	\$	9,916,025	\$	45,686,040	\$	1,552,027,203
14	\$	-	\$	11,643,328	\$	12,836,230	\$	-	\$	7,380,176	\$	31,859,734	\$	1,583,886,937
15	\$	-	\$	11,643,328	\$	12,836,230	\$	-	\$	7,985,511	\$	32,465,069	\$	1,616,352,006
16	\$	-	\$	11,643,328	\$	12,836,230	\$	-	\$	8,602,347	\$	33,081,905	\$	1,649,433,911
17	\$	-	\$	11,643,328	\$	-	\$	-	\$	4,390,538	\$	16,033,866	\$	1,665,467,777
18	\$	-	\$	11,643,328	\$	_	\$	_	\$	4,695,182	\$	16,338,510	\$	1,681,806,287
19	Ś	-	\$	11,643,328	\$	_	\$	_	\$	5,005,614	\$	16,648,942	\$	1,698,455,228
20	\$	_	\$	11,643,328	\$	_	\$	_	\$	5,321,943	\$	16,965,271	\$	1,715,420,500
21	¢	_	¢	11,643,328	\$	_	¢	_	¢	5,644,284	\$	17,287,612	¢	1,732,708,111
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	ې د	-	ې د	11,643,328		-	ې د	-	ې د	5,972,748	\$		ر ک	1,750,324,188
23	۶ د	-	>	11,643,328	\$	-	ب	-	\$ \$	6,307,454	\$	17,950,782	\$ \$	1,768,274,969
24	\$ \$	-	\$	11,643,328	\$	-	\$	-	\$	6,648,518	\$	18,291,846	\$	1,786,566,816
25	\$	-	\$	11,643,328	\$	-	\$	-	\$	6,996,064	\$	18,639,392	\$	1,805,206,207
26	\$	-	\$	11,643,328	\$	-	\$	-	\$	7,350,212	\$	18,993,540	\$	1,824,199,747
27	\$	-	\$	11,643,328	\$	-	\$	-	\$	7,711,089	\$	19,354,417	\$	1,843,554,164
28	\$	-	\$	11,643,328	\$	-	\$	-	\$	8,078,823	\$	19,722,151	\$	1,863,276,316
29	\$	-	\$	11,643,328	\$	-	\$	-	\$	8,453,544	\$	20,096,872	\$	1,883,373,188
30	\$	-	\$	11,643,328	\$	-	\$	-	\$	8,835,385	\$	20,478,713	\$	1,903,851,900
31	\$	-	\$	11,643,328	\$	-	\$	-	\$	9,224,480	\$	20,867,808	\$	1,924,719,709
32	\$	-	\$	11,643,328	\$	-	\$	-	\$	9,620,969	\$	21,264,297	\$	1,945,984,005
33	\$	-	\$	11,643,328	\$	-	\$	-	\$	10,024,990	\$	21,668,318	\$	1,967,652,323
34	\$	-	\$	11,643,328	\$	-	\$	-	\$	10,436,688	\$	22,080,016	\$	1,989,732,339
35	\$	-	\$	11,643,328	\$	_	\$	-	\$	10,856,209	\$	22,499,537	\$	2,012,231,876
36	\$	-	\$	11,643,328	\$	_	\$	-	\$	11,283,700	\$	22,927,028	\$	2,035,158,904
37	\$	-	\$	11,643,328	\$	-	\$	-	\$	11,719,313	\$	23,362,641	\$	2,058,521,545
38	\$	-	\$	11,643,328	\$	_	\$	_	\$	12,163,203	\$	23,806,531	\$	2,082,328,076
39	Ś	-	\$	11,643,328	\$	_	\$	_	\$	12,615,528	\$	24,258,856	\$	2,106,586,932
40	\$	_	\$	11,643,328	\$	_	\$	_	\$	13,076,446	\$	24,719,774	\$	2,131,306,706
41	\$	_	ς ,	11,643,328	ς ,	_	\$	_	ς ,	13,546,121	\$	25,189,449	\$	2,156,496,155
42	¢	_	¢	11,643,328	¢	_	ċ	_	¢	14,024,721	\$	25,668,049	¢	2,182,164,204
43	ب خ		ċ	11,643,328	ب خ	_	ب خ	_	ب خ	14,512,414	•	26,155,742	ب خ	2,208,319,946
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44	ې د	-	ې د	11,643,328	ې د	-	ې د	-	ې د	15,009,373	\$	26,652,701	ر ک	2,234,972,647
45 46	ې د	-	۶ خ	11,643,328	ې خ	-	ې د	-	ې خ	15,515,774	\$	27,159,102	\$ \$	2,262,131,750
46	\$	-	\$	11,643,328	\$	-	\$	-	\$	16,031,797	\$	27,675,125	\$	2,289,806,875
47	\$	-	\$	11,643,328	\$	-	\$	-	\$	16,557,625	\$	28,200,953	\$	2,318,007,828
48	\$	-	\$	11,643,328	\$	-	\$	-	\$	17,093,443	\$	28,736,771	\$	2,346,744,598
49	\$	-	\$	11,643,328	\$	-	\$	-	\$	17,639,441	\$	29,282,769	\$	2,376,027,368
50	\$	-	\$	11,643,328	\$	-	\$	-	\$	18,195,814	\$	29,839,142	\$	2,405,866,510
51	\$	-	\$	-	\$	-	\$	21,175,000	\$	34,122,666	\$	55,297,666	\$	2,461,164,176
52	\$	-	\$	-	\$	-	\$	26,250,000	\$	43,603,292	\$	69,853,292	\$	2,531,017,468
53	\$	-	\$	-	\$	-	\$	38,758,429	\$	66,340,410	\$	105,098,839	\$	2,636,116,307
54	\$	-	\$	-	\$	-	\$	38,758,429	\$	68,337,288	\$	107,095,717	\$	2,743,212,023
55	\$	-	\$	-	\$	-	\$	38,758,429	\$	70,372,106	\$	109,130,535	\$	2,852,342,558
56	\$	-	\$	-	\$	_	\$	-	\$	· -	\$	-	\$	2,852,342,558
57	\$	-	\$	-	\$	_	\$	-	\$	-	\$	-	\$	2,852,342,558
58	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,852,342,558
59	\$	_	\$	-	Ś	_	\$	-	\$	_	Ś	_	\$	2,852,342,558
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		Total		Total				Total		Total				Total
	r	Design/Const		O&M				D&D		Escalation				Life Cycle
		1 153 181 855	¢		¢	77 017 379	¢	163 700 287	¢	913 831 22/			¢	2 852 3/2 558

\$ 163,700,287

913,831,224

\$ 2,852,342,558



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 7 - C-STD, EXPANDED, LOW SEISMIC

LIFE CYCLE COST - 80 YEAR OPERATING LIFE



Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Expanded Project - C-STD 60/40 Vertical/Horizontal - Low Seismic

Separate CHB

80 Year Operating Life

VFAR	80 Yea	r Op	erating Life								Ann	ual Escalation		Discount Rate 3.40%
												1.50/0	Annual	3.4070
S	YEAR	ı	Design/Const		O&M		Cask Handling		D&D			Escalation		Cumulative
\$ 2,000,000 \$. \$. \$. \$. \$ 1,161,779 \$2	1	\$	10,000,000	\$	-	\$	-	\$		-	\$	190,000	\$10,190,000	\$10,190,000
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53 \$ - \$ 12,142,325 \$ - \$ 20,783,267 \$32,925,592 \$2,566,899,178 54 \$ - \$ 12,142,325 \$ - \$ 21,408,854 \$33,551,178 \$2,600,450,356 55 \$ - \$ 12,142,325 \$ - \$ 22,046,326 \$34,188,651 \$2,634,639,007 56 \$ - \$ 12,142,325 \$ - \$ 22,695,910 \$34,838,235 \$2,669,477,242 57 \$ - \$ 12,142,325 \$ - \$ 23,357,837 \$35,500,161 \$2,704,977,403 58 \$ - \$ 12,142,325 \$ - \$ 24,032,340 \$36,174,665 \$2,741,152,068 59 \$ - \$ 12,142,325 \$ - \$ 24,719,659 \$36,861,983 \$2,778,014,051 60 \$ - \$ 12,142,325 \$ -		ې د	-	۶ د		ې د	_	۶ د		_	ې د			
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55 \$ - \$ 12,142,325 \$ - \$ 22,046,326 \$34,188,651 \$2,634,639,007 56 \$ - \$ 12,142,325 \$ - \$ 22,046,326 \$34,188,651 \$2,634,639,007 56 \$ - \$ 12,142,325 \$ - \$ 22,695,910 \$34,838,235 \$2,669,477,242 57 \$ - \$ 12,142,325 \$ - \$ 23,357,837 \$35,500,161 \$2,704,977,403 58 \$ - \$ 12,142,325 \$ - \$ 24,032,340 \$36,174,665 \$2,741,152,068 59 \$ - \$ 12,142,325 \$ - \$ 24,719,659 \$36,861,983 \$2,778,014,051 60 \$ - \$ 12,142,325 \$ - \$ 25,420,036 \$37,562,361 \$2,815,576,412 61 \$ - \$ 12,142,325 \$ - \$ 26,133,721 \$38,276,046 \$2,853,852,457		\$	_	\$		\$	_	\$		_	\$			
56 \$ - \$ 12,142,325 \$ - \$ 22,695,910 \$34,838,235 \$2,669,477,242 57 \$ - \$ 12,142,325 \$ - \$ 23,357,837 \$35,500,161 \$2,704,977,403 58 \$ - \$ 12,142,325 \$ - \$ 24,032,340 \$36,174,665 \$2,741,152,068 59 \$ - \$ 12,142,325 \$ - \$ 24,719,659 \$36,861,983 \$2,778,014,051 60 \$ - \$ 12,142,325 \$ - \$ 25,420,036 \$37,562,361 \$2,815,576,412 61 \$ - \$ 12,142,325 \$ - \$ 26,133,721 \$38,276,046 \$2,853,852,457		\$	-	\$		\$	-	\$		_	\$			
57 \$ - \$ 12,142,325 \$ - \$ 23,357,837 \$35,500,161 \$2,704,977,403 58 \$ - \$ 12,142,325 \$ - \$ 24,032,340 \$36,174,665 \$2,741,152,068 59 \$ - \$ 12,142,325 \$ - \$ 24,719,659 \$36,861,983 \$2,778,014,051 60 \$ - \$ 12,142,325 \$ - \$ 25,420,036 \$37,562,361 \$2,815,576,412 61 \$ - \$ 12,142,325 \$ - \$ 26,133,721 \$38,276,046 \$2,853,852,457		\$	-	\$		\$	-	\$		_	\$			
58 \$ - \$ 12,142,325 \$ - \$ 24,032,340 \$36,174,665 \$2,741,152,068 59 \$ - \$ 12,142,325 \$ - \$ 24,719,659 \$36,861,983 \$2,778,014,051 60 \$ - \$ 12,142,325 \$ - \$ 25,420,036 \$37,562,361 \$2,815,576,412 61 \$ - \$ 12,142,325 \$ - \$ 26,133,721 \$38,276,046 \$2,853,852,457		\$	-	\$			-	\$	-	-	\$			
59 \$ - \$ 12,142,325 \$ - \$ 24,719,659 \$36,861,983 \$2,778,014,051 60 \$ - \$ 12,142,325 \$ - \$ 25,420,036 \$37,562,361 \$2,815,576,412 61 \$ - \$ 12,142,325 \$ - \$ 26,133,721 \$38,276,046 \$2,853,852,457		\$	-				-	\$		-	\$			
60 \$ - \$ 12,142,325 \$ - \$ 25,420,036 \$37,562,361 \$2,815,576,412 61 \$ - \$ 12,142,325 \$ - \$ 26,133,721 \$38,276,046 \$2,853,852,457	59	\$	-	\$	12,142,325		-	\$		-	\$	24,719,659	\$36,861,983	\$2,778,014,051
	60	\$	-	\$	12,142,325		-	\$	-	-	\$	25,420,036	\$37,562,361	\$2,815,576,412
A6-70	61	\$	-	\$	12,142,325	\$	-	\$		-	\$	26,133,721	\$38,276,046	\$2,853,852,457
								Αθ	5-70					



62	\$	-	\$	12,142,325	\$	-	\$ -	\$ 26,860,966	\$39,003,291	\$2,892,855,748
63	\$	-	\$	12,142,325	\$	-	\$ -	\$ 27,602,028	\$39,744,353	\$2,932,600,101
64	\$	-	\$	12,142,325	\$	-	\$ -	\$ 28,357,171	\$40,499,496	\$2,973,099,597
65	\$	-	\$	12,142,325	\$	-	\$ -	\$ 29,126,662	\$41,268,986	\$3,014,368,583
66	\$	-	\$	12,142,325	\$	-	\$ -	\$ 29,910,772	\$42,053,097	\$3,056,421,680
67	\$	-	\$	12,142,325	\$	-	\$ -	\$ 30,709,781	\$42,852,106	\$3,099,273,786
68	\$	-	\$	12,142,325	\$	-	\$ -	\$ 31,523,971	\$43,666,296	\$3,142,940,081
69	\$	-	\$	12,142,325	\$	-	\$ -	\$ 32,353,631	\$44,495,955	\$3,187,436,037
70	\$	-	\$	12,142,325	\$	-	\$ -	\$ 33,199,054	\$45,341,379	\$3,232,777,415
71	\$	-	\$	12,142,325	\$	-	\$ -	\$ 34,060,540	\$46,202,865	\$3,278,980,280
72	\$	-	\$	12,142,325	\$	-	\$ -	\$ 34,938,395	\$47,080,719	\$3,326,060,999
73	\$	-	\$	12,142,325	\$	-	\$ -	\$ 35,832,928	\$47,975,253	\$3,374,036,252
74	\$	-	\$	12,142,325	\$	-	\$ -	\$ 36,744,458	\$48,886,783	\$3,422,923,035
75	\$	-	\$	12,142,325	\$	-	\$ -	\$ 37,673,307	\$49,815,631	\$3,472,738,666
76	\$	-	\$	12,142,325	\$	-	\$ -	\$ 38,619,804	\$50,762,128	\$3,523,500,795
77	\$	-	\$	12,142,325	\$	-	\$ -	\$ 39,584,284	\$51,726,609	\$3,575,227,404
78	\$	-	\$	12,142,325	\$	-	\$ -	\$ 40,567,090	\$52,709,415	\$3,627,936,818
79	\$	-	\$	12,142,325	\$	-	\$ -	\$ 41,568,569	\$53,710,893	\$3,681,647,711
80	\$	-	\$	12,142,325	\$	-	\$ -	\$ 42,589,076	\$54,731,400	\$3,736,379,112
81	\$	-	\$	12,142,325	\$	-	\$ -	\$ 43,628,972	\$55,771,297	\$3,792,150,409
82	\$	-	\$	12,142,325	\$	-	\$ -	\$ 44,688,627	\$56,830,952	\$3,848,981,360
83	\$	-	\$	12,142,325	\$	-	\$ -	\$ 45,768,415	\$57,910,740	\$3,906,892,100
84	\$	-	\$	12,142,325	\$	-	\$ -	\$ 46,868,719	\$59,011,044	\$3,965,903,144
85	\$	-	\$	12,142,325	\$	-	\$ -	\$ 47,989,929	\$60,132,254	\$4,026,035,397
86	\$	-	\$	12,142,325	\$	-	\$ -	\$ 49,132,442	\$61,274,766	\$4,087,310,164
87	\$	-	\$	12,142,325	\$	-	\$ -	\$ 50,296,662	\$62,438,987	\$4,149,749,151
88	\$	-	\$	12,142,325	\$	-	\$ -	\$ 51,483,003	\$63,625,328	\$4,213,374,478
89	\$	-	\$	12,142,325	\$	-	\$ -	\$ 52,691,884	\$64,834,209	\$4,278,208,687
90	\$	-	\$	12,142,325	\$	-	\$ -	\$ 53,923,734	\$66,066,059	\$4,344,274,746
91					\$	-	\$ 21,175,000	\$ 96,226,640	\$117,401,640	\$4,461,676,386
92					\$	-	\$ 26,250,000	\$ 122,054,468	\$148,304,468	\$4,609,980,855
93					\$	-	\$ 38,758,429	\$ 184,375,328	\$223,133,757	\$4,833,114,611
94					\$	-	\$ 38,758,429	\$ 188,614,869	\$227,373,298	\$5,060,487,910
95					\$	-	\$ 38,758,429	\$ 192,934,962	\$231,693,391	\$5,292,181,300
96							\$ -	\$ -	\$0	\$5,292,181,300
97							\$ -	\$ -	\$0	\$5,292,181,300
98								\$ -	\$0	\$5,292,181,300
99								\$ -	\$0	\$5,292,181,300
100								\$ -	\$0	\$5,292,181,300
		Total		Total		Total	Total	Total		Total
	Des	sign/Const		O&M	Ca	ask Handling	D&D	Escalation		Life Cycle
	\$1,	153,181,855	Ç	51,072,964,898		\$77,017,378	\$163,700,287	\$2,825,316,883		\$5,292,181,300



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 8 - C-STD, EXPANDED, HIGH SEISMIC

LIFE CYCLE COST SUMMARIES

\$1,766,733,204



Interim Storage Facility

Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Expanded Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

Present Value

Annual Escalation Factor 1.90%
Discount Rate 3.40%

Life Cycle Costs (40 Year Life) Design & Construction	Capital \$1,228,765,314	Operations	Transport	Decommissioning	Escalation	Total Costs \$1,228,765,314
Operations & Maintenance (40 Year Life)		\$587,271,913				\$587,271,913
Cask Handling		\$77,017,378				\$77,017,378
Transportation Equipment	\$0					\$0
Transport Operations		\$0	\$0			\$0
Repackaging	\$0	\$0				\$0
Transport to Repository	\$0		\$0			\$0
D&D				\$182,186,741		\$182,186,741
Escalation					\$982,538,098	\$982,538,098
Total Costs (40 year Life)						\$3,057,779,442
Present Value						\$1,627,935,317
Life Cycle Costs (80 Year Life)	Capital	Operations	Transport	Decommissioning	Escalation	Total Costs
Life Cycle Costs (80 Year Life) Design & Construction	Capital \$1,228,765,314	Operations	Transport	Decommissioning	Escalation	Total Costs \$1,228,765,314
		Operations \$1,072,964,898	Transport	Decommissioning	Escalation	
Design & Construction		·	Transport	Decommissioning	Escalation	\$1,228,765,314
Design & Construction Operations & Maintenance (80 Year Life)		\$1,072,964,898	Transport	Decommissioning	Escalation	\$1,228,765,314 \$1,072,964,898
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling	\$1,228,765,314	\$1,072,964,898	Transport \$0	Decommissioning	Escalation	\$1,228,765,314 \$1,072,964,898 \$77,017,378 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment	\$1,228,765,314 \$0 \$0	\$1,072,964,898 \$77,017,378	\$0	Decommissioning	Escalation	\$1,228,765,314 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository	\$1,228,765,314 \$0	\$1,072,964,898 \$77,017,378 \$0	·		Escalation	\$1,228,765,314 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0 \$0
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository D&D	\$1,228,765,314 \$0 \$0	\$1,072,964,898 \$77,017,378 \$0	\$0	Decommissioning \$182,186,741		\$1,228,765,314 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0 \$0 \$182,186,741
Design & Construction Operations & Maintenance (80 Year Life) Cask Handling Transportation Equipment Transport Operations Repackaging Transport to Repository	\$1,228,765,314 \$0 \$0	\$1,072,964,898 \$77,017,378 \$0	\$0		Escalation \$2,928,880,119	\$1,228,765,314 \$1,072,964,898 \$77,017,378 \$0 \$0 \$0 \$0



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 8 - C-STD, EXPANDED, HIGH SEISMIC

CAPITAL COST SUMMARY

\$10,000,000



Interim Storage Facility

Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Expanded Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

Level 3 Cost Summary - First of A kind module

Level 1	Level 2	Level 3 De	escription			Level 3 Total
C-STD LE EX 01			•	e Facility and transportation Project		
	C-STD LE EX 01.01		_	ISF Facility	\$552,057,398	
		C-STD LE EX 01.0		Storage STDs		\$0
		C-STD LE EX 01.0		Cask Handling (Transfer) Facility		\$163,293,960
		C-STD LE EX 01.0		Horizontal Dry Storage Modules		\$123,041,942
		C-STD LE EX 01.0		Vertical Dry Storage Module		\$106,582,334
		C-STD LE EX 01.0		Storage Cask Fabrication Facility		\$0 \$0
		C-STD LE EX 01.0 C-STD LE EX 01.0		Cask Maintenance Facility Concrete Batch Plant		\$0 \$1,850,000
		C-STD LE EX 01.0		Visitor Center/ Auditorium		\$1,830,000 \$0
		C-STD LE EX 01.0		Administration Building		\$3,140,000
		C-STD LE EX 01.0		Security		\$24,148,975
		C-STD LE EX 01.0		Rail Spur/ Receiving Yard		\$58,752,800
		C-STD LE EX 01.0		Utilities		\$18,682,150
	(C-STD LE EX 01.0	1.13	Roads		\$18,212,737
	(C-STD LE EX 01.0	1.14	Parking		\$735,000
	(C-STD LE EX 01.0	1.15	Site Work		\$23,417,500
	(C-STD LE EX 01.0	1.16	Warehouse		\$10,200,000
		C-STD LE EX 01.0		Maintenance Facility		\$0
		C-STD LE EX 01.0		Waste management Facility		\$0
	(C-STD LE EX 01.0	1.01.xx	(Add Further Breakdown as needed)		\$0
	C-STD LE EX 01.02		Expa	nded Interim Storage Facility	\$256,891,105	
	(C-STD LE EX 01.0	2.01	Expanded Storage STDs and Dry Cask St	torage Systems	\$0
	(C-STD LE EX 01.0	2.02	Expanded Cask Handling Facility (if requ	uired)	\$0
	(C-STD LE EX 01.0	2.03	Horizontal Dry Storage Modules		\$123,041,942
		C-STD LE EX 01.0		Vertical Dry Storage Casks		\$106,582,334
		C-STD LE EX 01.0		Storage Cask Fabrication Facility (Expar	nded)	\$0
		C-STD LE EX 01.0		Cask Maintenance Facility (Expanded)	1 N	\$0
		C-STD LE EX 01.0		Concrete Batch Plant (Expanded if need	-	\$1,850,000
		C-STD LE EX 01.0		Visitor Center/ Auditorium (expanded i	·	\$745,000
		C-STD LE EX 01.0 C-STD LE EX 01.0		Administration Building (Expanded if no Security (Expanded)	eeded)	\$0 \$10,074,488
		C-STD LE EX 01.0		Rail Spur/ Receiving Yard (Expanded)		\$10,074,488
		C-STD LE EX 01.0		Utilities Expanded as needed)		\$3,624,200
		C-STD LE EX 01.0		Roads (Expanded)		\$83,142
		C-STD LE EX 01.0		Parking (Expanded as needed)		\$0
	(C-STD LE EX 01.0	2.15	Site Work (Expanded)		\$10,890,000
	(C-STD LE EX 01.0	2.16	Warehouse (Expanded if Needed)		\$0
	(C-STD LE EX 01.0	2.17	Maintenance Facility (Expanded if need	ded)	\$0
	(C-STD LE EX 01.0	2.18	Waste management Facility (Expanded	if needed)	\$0
	(C-STD LE EX 01.0	2.19	Hot Cell / Laboratories		\$0
		C-STD LE EX 01.0		Pool Packaging Facility		\$0
		C-STD LE EX 01.0		Standardized Storage System		\$0
		C-STD LE EX 01.0		Standardized Disposal Canister		\$0
		C-STD LE EX 01.0		Canister Repackaging Facility (For Repo	•	\$0
	C-STD LE EX 01.03			sportation Equipment	\$0	ćo
		C-STD LE EX 01.0 C-STD LE EX 01.0		Transportation Casks Rail Equipment		\$0 \$0
		C-STD LE EX 01.0 C-STD LE EX 01.0		Rail Maintenance Facility		\$0 \$0
		C-STD LE EX 01.0		Transportation Systems Services		\$0 \$0
		· · · · · · · · · · · · · · · · · ·		,		7-5
	C-STD LE EX 01.04			Construction Capitalized Costs	\$66,025,000	A.
		C-STD LE EX 01.0		Land or Land Leases		\$7,680,000
		C-STD LE EX 01.0		Site permits		\$200,000
		C-STD LE EX 01.0		Site Licensing Plant Permits		\$6,240,000 \$0
		C-STD LE EX 01.0 C-STD LE EX 01.0		Planning and Alternative Studies		\$0 \$750,000
		C-STD LE EX 01.0 C-STD LE EX 01.0		Research and Development		\$750,000 \$0
		C-STD LE EX 01.0 C-STD LE EX 01.0		Design		\$0 \$23,955,000
		C-STD LE EX 01.0		Other Pre-construction Costs		\$17,200,000
		C-STD LE EX 01.0		Pre-construction contingencies		\$10,000,000

Pre-construction contingencies

C-STD LE EX 01.04.10



C-STD LE EX 01.04.xx	(Add Further Breakdown as needed)	\$0
C-STD LE EX 01.05	Indirect Capitalized Costs \$63,180,000	
C-STD LE EX 01.05.01	Project Management	\$2,700,000
C-STD LE EX 01.05.02	Construction Management	\$3,600,000
C-STD LE EX 01.05.03	Field indirect services	\$11,880,000
C-STD LE EX 01.05.04	Design Services in support of Construction	\$5,400,000
C-STD LE EX 01.05.05	QA/QC	\$12,600,000
C-STD LE EX 01.05.06	Commissioning and Startup	\$1,200,000
C-STD LE EX 01.05.07	Home office Engineering support to Construction	\$7,200,000
C-STD LE EX 01.05.08	Document Control	\$2,700,000
C-STD LE EX 01.05.09	Project Controls	\$3,600,000
C-STD LE EX 01.05.10	Construction Testing	\$2,700,000
C-STD LE EX 01.05.11	Inspections	\$3,600,000
C-STD LE EX 01.05.12	Startup and Testing	\$3,000,000
C-STD LE EX 01.05.13	Commissioning	\$3,000,000
C-STD LE EX 01.06	Site Selection \$0	
C-STD LE EX 01.06.01	Site Selection	\$0
C-STD LE EX 01.06.02	Public Information Process	\$0
C-STD LE EX 01.07	Decontamination and Deconstruction \$0	
C-STD LE EX 01.07.01	Decommissioning	\$0
C-STD LE EX 01.07.02	Decontamination	\$0
C-STD LE EX 01.07.03	Deconstruction	\$0
C-STD LE EX 01.07.04		\$0
C-STD LE EX 01.07.05		\$0
C-STD LE EX 01.08	Project Financial Costs \$125,712,569	
C-STD LE EX 01.08.01	Contractor Fees	\$75,052,280
C-STD LE EX 01.08.02	Escalation Costs	\$50,660,289
C-STD LE EX 01.08.03	Interest Payments	\$0
C-STD LE EX 01.08.04	Indirect costs to support shipments to repository	\$0
C-STD LE EX 01.08.05		\$0
C-STD LE EX 01.08.xx	(Add Further Breakdown as needed)	\$0
C-STD LE EX 01.09	Project Contingencies \$164,899,241	
C-STD LE EX 01.09.01	Management Reserve - Contractor Held	\$53,193,304
C-STD LE EX 01.09.02	Contingency - DOE held	\$111,705,938
0 315 EE EX 01.03.02	contingency borner	Ψ111,703,330
C-STD LE EX 01.10		
C-STD LE EX 01.10.01	Other Direct Costs \$0	
C-STD LE EX 01.10.02	DOE Project Operations	\$0
C-STD LE EX 01.10.03	DOE TM&E	\$0
C-STD LE EX 01.10.04	Host site Operational Costs Miscellaneous	\$0
C-STD LE EX 01.10.05	Miscellaneous ODC	\$0
C-STD LE EX 01.11	Operational Costs 0	
C-STD LE EX 01.11.01	Operations Costs	\$0
C-STD LE EX 01.11.02	Transportation Costs	\$0
C-STD LE EX 01.11.03	Escalation (Operations/Transportation)	\$0
	(All Direct & indirect Costs, MR,	
	TEC Escalation)	\$1,117,059,376
	TPC (TEC plus Contingency, ODCs)	\$1,228,765,314

Project Total

All Capitol, Operation, Transportion, \$1,228,765,314 LCC Escalation



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 8 - C-STD, EXPANDED, HIGH SEISMIC

LIFE CYCLE COST - 40 YEAR OPERATING LIFE



Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Design/Const

\$ 1,228,765,314

0&M

\$ 587,271,913

Expanded Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

Separa	ite Cl	НВ							Anr	nual Escalation			Dis	count Rate
40 Yea	•	erating life								1.90%				3.40%
YEAR		Design/Const		O&M	C	ask Handling		D&D		Escalation		nual Expense		Cumulative
1	\$	10,000,000	\$	-	\$	-	\$	-	\$	190,000	\$	10,190,000	\$	10,190,000
2	\$	10,000,000	\$	-	\$ ¢	-	\$ ¢	-	\$ ¢	383,610	\$	10,383,610	\$	20,573,610
3	\$ ¢	20,000,000 20,000,000	\$ د	-	¢	-	۶ د	-	۶ د	1,161,797	\$ ¢	21,161,797	\$ ¢	41,735,407
5	ې د	20,000,000	ې د	-	ې د	_	ې د	-	ې د	1,563,871 1,973,585	\$ \$	21,563,871 21,973,585	\$ \$	63,299,279 85,272,863
6	ې د	20,000,000	ې د	_	ې د	-	ې د	_	ې د	2,391,083	۶ \$	22,391,083	۶ \$	107,663,946
7	\$	27,888,399	ς ς	_	ب خ	_	٠ <	_	٠ \$	3,927,403	\$	31,815,802	\$	139,479,748
8	\$	200,000,000	\$	_	\$	_	\$	_	\$	32,500,273	\$	232,500,273	\$	371,980,021
9	\$	200,000,000	\$	28,996,032	\$	_	\$	_	\$	42,270,124	\$	271,266,156	\$	643,246,177
10	\$	700,876,915	\$	26,860,352	\$	_	\$	_	\$	150,711,536	\$	878,448,803	\$	1,521,694,980
11	,		\$	27,383,172	\$	12,836,230	\$	_	\$	9,251,706	\$	49,471,107	\$	1,571,166,088
12	\$	-	\$	27,383,172	\$	12,836,230	\$	-	\$	10,191,657	, \$	50,411,059	\$	1,621,577,146
13	\$	-	\$	27,383,172	\$	12,836,230	\$	-	\$	11,149,467	\$	51,368,869	\$	1,672,946,015
14	\$	-	, \$	12,142,325	\$	12,836,230	\$	-	\$	7,530,615	\$	32,509,169	\$	1,705,455,184
15	\$	-	\$	12,142,325	\$	12,836,230	\$	-	\$	8,148,289	\$	33,126,844	\$	1,738,582,028
16	\$	-	\$	12,142,325	\$	12,836,230	\$	-	\$	8,777,699	\$	33,756,254	\$	1,772,338,282
17	\$	-	\$	12,142,325	\$	-	\$	-	\$	4,578,703	\$	16,721,028	\$	1,789,059,309
18	\$	-	\$	12,142,325	\$	-	\$	-	\$	4,896,403	\$	17,038,727	\$	1,806,098,037
19	\$	-	\$	12,142,325	\$	-	\$	-	\$	5,220,138	\$	17,362,463	\$	1,823,460,500
20	\$	-	\$	12,142,325	\$	-	\$	-	\$	5,550,025	\$	17,692,350	\$	1,841,152,850
21	\$	-	\$	12,142,325	\$	-	\$	-	\$	5,886,180	\$	18,028,505	\$	1,859,181,354
22	\$	-	\$	12,142,325	\$	-	\$	-	\$	6,228,722	\$	18,371,046	\$	1,877,552,400
23	\$	-	\$	12,142,325	\$	-	\$	-	\$	6,577,771	\$	18,720,096	\$	1,896,272,496
24	\$	-	\$	12,142,325	\$	-	\$	-	\$	6,933,453	\$	19,075,778	\$	1,915,348,274
25	\$	-	\$	12,142,325	\$	-	\$	-	\$	7,295,893	\$	19,438,218	\$	1,934,786,492
26	\$	-	\$	12,142,325	\$	-	\$	-	\$	7,665,219	\$	19,807,544	\$	1,954,594,036
27	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,041,562	\$	20,183,887	\$	1,974,777,923
28	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,425,056	\$	20,567,381	\$	1,995,345,304
29	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,815,837	\$	20,958,161	\$	2,016,303,465
30	\$	-	\$	12,142,325	\$	-	\$	-	\$	9,214,042	\$	21,356,366	\$	2,037,659,831
31	\$	-	\$	12,142,325	\$	-	\$	-	\$	9,619,813	\$	21,762,137	\$	2,059,421,968
32	\$	-	\$	12,142,325	\$	-	\$	-	\$	10,033,293	\$	22,175,618	\$	2,081,597,586
33	\$	-	\$	12,142,325	\$	-	\$	-	\$	10,454,630	\$	22,596,955	\$	2,104,194,541
34	\$	-	\$	12,142,325	\$	-	\$	-	\$	10,883,972	\$	23,026,297	\$	2,127,220,837
35	\$	-	\$	12,142,325	\$	-	\$	-	\$	11,321,472	\$	23,463,796	\$	2,150,684,634
36	Ş _	-	\$	12,142,325	\$	-	\$	-	\$	11,767,284	\$	23,909,608	\$	2,174,594,242
37	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$	12,221,566	\$	24,363,891	\$	2,198,958,133
38	\$ \$	-	\$ ¢	12,142,325	\$	-	\$ \$	-	\$ ¢	12,684,480	\$ ¢	24,826,805	\$ ¢	2,223,784,938
39	\$ \$	-	\$ ¢	12,142,325	\$	-	\$ \$	-	\$ ¢	13,156,190	\$ ¢	25,298,514	\$ ¢	2,249,083,452
40	۶ ۲	-	<u>ې</u>	12,142,325	خ	-	<u>ې</u>	-	<u>ې</u>	13,636,861	\$ ¢	25,779,186	<u>></u>	2,274,862,638
41	۶ ۲	-	<u>ې</u>	12,142,325	خ	-	<u>ې</u>	-	<u>ې</u>	14,126,666	\$ د	26,268,991	<u>></u>	2,301,131,629
42 43	ې د	-	ې د	12,142,325 12,142,325	ې د	-	ې د	-	ې د	14,625,777 15,134,371	\$ ¢	26,768,101 27,276,695	ې د	2,327,899,730 2,355,176,425
43 44	ې د	_	ې د	12,142,325	ې د	-	ې د	_	ې د	15,652,628	\$ \$	27,270,093	۶ \$	2,382,971,378
45	ب خ	_	ς ς	12,142,325	ب خ	_	٠ <	_	٠ \$	16,180,732	\$	28,323,057	ς ,	2,411,294,434
46	\$	_	\$	12,142,325	\$	_	\$	_	\$	16,718,870	\$	28,861,195	\$	2,440,155,629
47	\$	_	\$	12,142,325	\$	_	\$	_	\$	17,267,233	\$	29,409,557	\$	2,469,565,186
48	\$	_	\$	12,142,325	\$	_	\$	_	\$	17,826,014	\$	29,968,339	\$	2,499,533,525
49	\$	_	\$	12,142,325	\$	_	\$	_	\$	18,395,413	\$	30,537,737	\$	2,530,071,263
50	\$	-	\$	12,142,325	\$	_	\$	_	\$	18,975,630	\$	31,117,954	\$	2,561,189,217
51	\$	-	\$,- :-,	\$	_	\$	21,175,000	\$	34,122,666	\$	55,297,666	\$	2,616,486,883
52	\$	-	\$	-	\$	-	\$	35,750,000	, \$	59,383,531	, \$	95,133,531	\$	2,711,620,414
53	\$	-	\$	-	\$	-	\$	41,753,914	\$	71,467,596	\$	113,221,510	\$	2,824,841,924
54	\$	-	, \$	-	\$	-	\$	41,753,914	\$	73,618,805	\$	115,372,719	\$	2,940,214,642
55	\$	-	\$	-	\$	-	\$	41,753,914	\$	75,810,886	\$	117,564,800	, \$	3,057,779,442
56	\$	-	\$	-	\$	-	\$, -,· -	\$	-	\$	-	\$	3,057,779,442
57	\$	-	, \$	-	\$	-	\$	-	\$	-	\$	-	\$	3,057,779,442
58	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	3,057,779,442
59	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	3,057,779,442
60	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	3,057,779,442
		Total		Total				Total		Total				Total
	г	Design/Const		ORIM				טאט		Escalation				Life Cycle

\$ 77,017,378

D&D

\$ 182,186,741

Escalation

982,538,098

Life Cycle

\$ 3,057,779,442



STUDY 1 - ALTERNATIVE STORAGE SYSTEMS FOR DUAL PURPOSE CANISTERS

COST DETAILS

ALTERNATIVE 8 - C-STD, EXPANDED, HIGH SEISMIC

LIFE CYCLE COST - 80 YEAR OPERATING LIFE



Expanded Storage Facility (10,000 MTU)

Project: C-STD Expanded (10,000 MTU)

Expanded Project - C-STD 60/40 Vertical/Horizontal - High Seismic

Separate CHB

80 Year Operating Life

00 100	. 0	cruting Life							Anr	nual Escalation 1.90%		Discount Rate 3.40%
YEAR	[Design/Const		0&M	Ca	ask Handling		D&D		Escalation	Annual Funding	Cumulative
1	\$	10,000,000	\$	-	\$	-	\$	-	\$	190,000	\$10,190,000	\$10,190,000
2	\$	10,000,000	\$	-	\$	-	\$	-	\$	383,610	\$10,383,610	\$20,573,610
3	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,161,797	\$21,161,797	\$41,735,407
4	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,563,871	\$21,563,871	\$63,299,279
5	\$	20,000,000	\$	-	\$	-	\$	-	\$	1,973,585	\$21,973,585	\$85,272,863
6	\$	20,000,000	\$	-	\$	-	\$	-	\$	2,391,083	\$22,391,083	\$107,663,946
7	\$	27,888,399	\$	-	\$	-	\$	-	\$	3,927,403	\$31,815,802	\$139,479,748
8	\$	200,000,000	\$	-	\$	-	\$	-	\$	32,500,273	\$232,500,273	\$371,980,021
9	\$	200,000,000	\$	28,996,032	\$	-	\$	-	\$	42,270,124	\$271,266,156	\$643,246,177
10	\$	700,876,915	\$	26,860,352	\$	-	\$	-	\$	150,711,536	\$878,448,803	\$1,521,694,980
11			\$	27,383,172	\$	12,836,230	\$	-	\$	9,251,706	\$49,471,107	\$1,571,166,088
12	\$	-	\$	27,383,172	\$	12,836,230	\$	-	\$	10,191,657	\$50,411,059	\$1,621,577,146
13	\$	-	\$	27,383,172	\$	12,836,230	\$	-	\$ •	11,149,467	\$51,368,869	\$1,672,946,015
14	\$	-	\$	12,142,325	\$	12,836,230	\$	-	\$	7,530,615	\$32,509,169	\$1,705,455,184
15	\$	-	\$	12,142,325	\$	12,836,230	\$	-	\$ \$	8,148,289	\$33,126,844	\$1,738,582,028
16	\$ ¢	-	\$	12,142,325	\$ ¢	12,836,230	\$ ¢	-	\$ ¢	8,777,699	\$33,756,254	\$1,772,338,282
17 10	\$ ¢	-	\$ ¢	12,142,325	۶ د	-	Ş د	-	۶ د	4,578,703	\$16,721,028	\$1,789,059,309
18 10	\$ \$	-	\$ \$	12,142,325	۶ د	-	ې د	-	۶ د	4,896,403 5,320,138	\$17,038,727 \$17,362,463	\$1,806,098,037
19 20	ې د	_	\$ \$	12,142,325 12,142,325	ې د	-	ې د	-	ې د	5,220,138 5,550,025	\$17,562,465	\$1,823,460,500 \$1,841,152,850
21	۶ \$	_	۶ \$	12,142,325	۶ د	-	ې د	_	ب د	5,886,180	\$17,092,530	\$1,859,181,354
22	ς ς	_	\$	12,142,325	٠ \$	_	ς ς	_	\$	6,228,722	\$18,371,046	\$1,877,552,400
23	\$	_	\$	12,142,325	\$	_	\$	_	\$	6,577,771	\$18,720,096	\$1,896,272,496
24	\$	_	\$	12,142,325	\$	_	\$	_	\$	6,933,453	\$19,075,778	\$1,915,348,274
25	\$	_	\$	12,142,325	\$	_	\$	_	\$	7,295,893	\$19,438,218	\$1,934,786,492
26	\$	-	\$	12,142,325	\$	-	\$	_	\$	7,665,219	\$19,807,544	\$1,954,594,036
27	\$	-	\$	12,142,325	\$	-	\$	_	\$	8,041,562	\$20,183,887	\$1,974,777,923
28	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,425,056	\$20,567,381	\$1,995,345,304
29	\$	-	\$	12,142,325	\$	-	\$	-	\$	8,815,837	\$20,958,161	\$2,016,303,465
30	\$	-	\$	12,142,325	\$	-	\$	-	\$	9,214,042	\$21,356,366	\$2,037,659,831
31	\$	-	\$	12,142,325	\$	-	\$	-	\$	9,619,813	\$21,762,137	\$2,059,421,968
32	\$	-	\$	12,142,325	\$	-	\$	-	\$	10,033,293	\$22,175,618	\$2,081,597,586
33	\$	-	\$	12,142,325	\$	-	\$	-	\$	10,454,630	\$22,596,955	\$2,104,194,541
34	\$	-	\$	12,142,325	\$	-	\$	-	\$	10,883,972	\$23,026,297	\$2,127,220,837
35	\$	-	\$	12,142,325	\$	-	\$	-	\$	11,321,472	\$23,463,796	\$2,150,684,634
36	\$	-	\$	12,142,325	\$	-	\$	-	\$	11,767,284	\$23,909,608	\$2,174,594,242
37	\$	-	\$	12,142,325	\$	-	\$	-	\$	12,221,566	\$24,363,891	\$2,198,958,133
38	\$	-	\$	12,142,325	\$ \$	-	\$	-	\$ \$	12,684,480	\$24,826,805	\$2,223,784,938
39	\$ \$	-	\$	12,142,325	\$	-	\$	-	\$	13,156,190	\$25,298,514	\$2,249,083,452
40	\$ ¢	-	\$ ¢	12,142,325	\$ ¢	-	\$ ¢	-	\$ ¢	13,636,861	\$25,779,186	\$2,274,862,638
41 42	Ş د	-	۶ د	12,142,325	۶ د	-	Ş د	-	۶ د	14,126,666	\$26,268,991	\$2,301,131,629
42	ې د	-	ې د	12,142,325 12,142,325	۶ د	-	ې د	-	۶ د	14,625,777 15,134,371	\$26,768,101 \$27,276,695	\$2,327,899,730 \$2,355,176,425
44	ς ς	_	ب خ	12,142,325	٠ د	_	٠ ,	_	ς ς	15,652,628	\$27,794,952	\$2,382,971,378
45	ς ς	_	\$	12,142,325	\$	_	ς ς	_	\$	16,180,732	\$28,323,057	\$2,411,294,434
46	\$	_	\$	12,142,325	\$	_	\$	_	\$	16,718,870	\$28,861,195	\$2,440,155,629
47	\$	-	\$	12,142,325	\$	-	\$	_	\$	17,267,233	\$29,409,557	\$2,469,565,186
48	\$	-	\$	12,142,325	\$	-	\$	_	\$	17,826,014	\$29,968,339	\$2,499,533,525
49	\$	-	\$	12,142,325	\$	-	\$	_	\$	18,395,413	\$30,537,737	\$2,530,071,263
50	\$	-	\$	12,142,325	\$	-	\$	-	\$	18,975,630	\$31,117,954	\$2,561,189,217
51	\$	-	\$	12,142,325	\$	-	\$	-	\$	19,566,871	\$31,709,196	\$2,592,898,413
52	\$	-	\$	12,142,325	\$	-	\$	-	\$	20,169,346	\$32,311,670	\$2,625,210,083
53	\$	-	\$	12,142,325	\$	-	\$	-	\$	20,783,267	\$32,925,592	\$2,658,135,675
54	\$	-	\$	12,142,325	\$	-	\$	-	\$	21,408,854	\$33,551,178	\$2,691,686,853
55	\$	-	\$	12,142,325	\$	-	\$	-	\$	22,046,326	\$34,188,651	\$2,725,875,504
56	\$	-	\$	12,142,325	\$	-	\$	-	\$	22,695,910	\$34,838,235	
57	\$	-	\$	12,142,325	\$	-	\$	-	\$	23,357,837	\$35,500,161	\$2,796,213,900
58	\$	-	\$	12,142,325	\$	-	\$	-	\$	24,032,340	\$36,174,665	\$2,832,388,565
59	\$	-	\$	12,142,325	\$	-	\$	-	\$	24,719,659	\$36,861,983	\$2,869,250,548
60	\$	-	\$	12,142,325	\$	-	\$	-	\$	25,420,036	\$37,562,361	\$2,906,812,908
61	\$ •	-	\$ •	12,142,325	\$ •	-	\$ •	-	\$ •	26,133,721	\$38,276,046	\$2,945,088,954
62	\$	-	\$	12,142,325	\$	-	\$	-	Ş	26,860,966	\$39,003,291	\$2,984,092,245

\$1,228,765,314

\$1,072,964,898

\$77,017,378

\$5,489,814,449



63	\$ -	\$ 12,142,325	\$	-	\$	-	\$ 27,602,028	\$39,744,353	\$3,023,836,598
64	\$ -	\$ 12,142,325	\$	-	\$	-	\$ 28,357,171	\$40,499,496	\$3,064,336,093
65	\$0	\$ 12,142,325	\$	-	\$	-	\$ 29,126,662	\$41,268,986	\$3,105,605,080
66	\$0	\$ 12,142,325	\$	-	\$	-	\$ 29,910,772	\$42,053,097	\$3,147,658,177
67	\$0	\$ 12,142,325	\$	-	\$	-	\$ 30,709,781	\$42,852,106	\$3,190,510,282
68	\$0	\$ 12,142,325	\$	-	\$	-	\$ 31,523,971	\$43,666,296	\$3,234,176,578
69	\$0	\$ 12,142,325	\$	-	\$	-	\$ 32,353,631	\$44,495,955	\$3,278,672,533
70	\$0	\$ 12,142,325	\$	-	\$	-	\$ 33,199,054	\$45,341,379	\$3,324,013,912
71	\$0	\$ 12,142,325	\$	-	\$	-	\$ 34,060,540	\$46,202,865	\$3,370,216,777
72	\$0	\$ 12,142,325	\$	-	\$	-	\$ 34,938,395	\$47,080,719	\$3,417,297,496
73	\$0	\$ 12,142,325	\$	-	\$	-	\$ 35,832,928	\$47,975,253	\$3,465,272,749
74	\$0	\$ 12,142,325	\$	-	\$	-	\$ 36,744,458	\$48,886,783	\$3,514,159,531
75	\$0	\$ 12,142,325	\$	-	\$	-	\$ 37,673,307	\$49,815,631	\$3,563,975,163
76	\$0	\$ 12,142,325	\$	-	\$	-	\$ 38,619,804	\$50,762,128	\$3,614,737,291
77	\$0	\$ 12,142,325	\$	-	\$	-	\$ 39,584,284	\$51,726,609	\$3,666,463,900
78	\$0	\$ 12,142,325	\$	-	\$	-	\$ 40,567,090	\$52,709,415	\$3,719,173,315
79	\$0	\$ 12,142,325	\$	-	\$	-	\$ 41,568,569	\$53,710,893	\$3,772,884,208
80	\$0	\$ 12,142,325	\$	-	\$	-	\$ 42,589,076	\$54,731,400	\$3,827,615,609
81	\$0	\$ 12,142,325	\$	-	\$	-	\$ 43,628,972	\$55,771,297	\$3,883,386,906
82	\$0	\$ 12,142,325	\$	-	\$	-	\$ 44,688,627	\$56,830,952	\$3,940,217,857
83	\$0	\$ 12,142,325	\$	-	\$	-	\$ 45,768,415	\$57,910,740	\$3,998,128,597
84	\$0	\$ 12,142,325	\$	-	\$	-	\$ 46,868,719	\$59,011,044	\$4,057,139,641
85	\$0	\$ 12,142,325	\$	-	\$	-	\$ 47,989,929	\$60,132,254	\$4,117,271,894
86	\$0	\$ 12,142,325	\$	-	\$	-	\$ 49,132,442	\$61,274,766	\$4,178,546,661
87	\$0	\$ 12,142,325	\$	-	\$	-	\$ 50,296,662	\$62,438,987	\$4,240,985,647
88	\$0	\$ 12,142,325	\$	-	\$	-	\$ 51,483,003	\$63,625,328	\$4,304,610,975
89	\$0	\$ 12,142,325	\$	-	\$	-	\$ 52,691,884	\$64,834,209	\$4,369,445,184
90	\$0	\$ 12,142,325	\$	-	\$	-	\$ 53,923,734	\$66,066,059	\$4,435,511,243
91			\$	-	\$	21,175,000	\$ 96,226,640	\$117,401,640	\$4,552,912,883
92			\$	-	\$	35,750,000	\$ 166,226,562	\$201,976,562	\$4,754,889,445
93			\$	-	\$	41,753,914	\$ 198,624,963	\$240,378,877	\$4,995,268,322
94			\$	-	\$	41,753,914	\$ 203,192,162	\$244,946,076	\$5,240,214,398
95			\$	-	\$	41,753,914	\$ 207,846,138	\$249,600,051	\$5,489,814,449
96					\$	-	\$ -	\$0	\$5,489,814,449
97					\$	-	\$ -	\$0	\$5,489,814,449
98					•		\$ -	\$0	\$5,489,814,449
99							\$ -	\$0	\$5,489,814,449
100							\$ -	\$0	\$5,489,814,449
	Total	Total	Total			Total	Total		Total
	Design/Const	0&M	Cask Handlir	ng		D&D	Escalation		Life Cycle

\$182,186,741

\$2,928,880,119