Table C-3
Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Buriad / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 0a - Pre-Shutdown Early Planning																					
Period 0a Period-Dependent Costs																					
0a.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0a.4.3	Plant energy budget	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0a.4.4	Utility Staff Cost	-	-	-	-	-	-	2,108	316	2,424	2,424	-	-	-	-	-	-	-	-	-	34,001
0a.4	Subtotal Period 0a Period-Dependent Costs	-	-	-	-	-	-	2,108	316	2,424	2,424	-	-	-	-	-	-	-	-	-	34,001
0a.0	TOTAL PERIOD 0a COST	-	-	-	-	-	-	2,108	316	2,424	2,424	-	-	-	-	-	-	-	-	-	34,001
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	47	7	54	54	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	72	11	83	83	-	-	-	-	-	-	-	-	-	856
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	167	25	192	192	-	-	-	-	-	-	-	-	-	1,969
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	47	7	54	54	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	3,210
1a.1.13	Perform SER and EA	-	-	-	-	-	-	112	17	129	129	-	-	-	-	-	-	-	-	-	1,327
1a.1.14	Prepare/submit Defueled Technical Specifications	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	3,210
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	181	27	208	208	-	-	-	-	-	-	-	-	-	2,140
1a.1.16	Prepare/submit Irradiated Fuel Management Plan	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	178	27	205	185	-	21	-	-	-	-	-	-	-	2,106
1a.1.17.2	Plant systems	-	-	-	-	-	-	151	23	174	156	-	17	-	-	-	-	-	-	-	1,785
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	18	3	21	21	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	257	39	296	296	-	-	-	-	-	-	-	-	-	3,039
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	236	35	271	271	-	-	-	-	-	-	-	-	-	2,782
1a.1.17.6	Biological shield	-	-	-	-	-	-	18	3	21	21	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	113	17	130	130	-	-	-	-	-	-	-	-	-	1,335
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	58	9	67	33	-	33	-	-	-	-	-	-	-	685
1a.1.17.9	Main Turbine	-	-	-	-	-	-	14	2	17	-	-	17	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	14	2	17	-	-	17	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	113	17	130	65	-	65	-	-	-	-	-	-	-	1,335
1a.1.17.12	Waste management	-	-	-	-	-	-	167	25	192	192	-	-	-	-	-	-	-	-	-	1,969
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	33	5	38	19	-	19	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	1,371	206	1,577	1,388	-	188	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	87	13	100	100	-	-	-	-	-	-	-	-	-	1,027
1a.1.19	Plant prep. & temp. svcss	-	-	-	-	-	-	4,000	600	4,600	4,600	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	51	8	58	58	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,800	420	3,220	3,220	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	45	7	51	51	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,633	1,445	11,078	10,890	-	188	-	-	-	-	-	-	-	33,451
Period 1a Additional Costs																					
1a.2.1	Staff Transition	-	-	-	-	-	-	43,868	6,580	50,449	50,449	-	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	43,868	6,580	50,449	50,449	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,551	155	1,706	1,706	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	222	22	244	244	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	558	-	-	-	-	-	139	695	695	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	137	-	-	-	-	-	66	503	503	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	8	5	-	23	-	7	43	43	-	-	-	376	-	-	-	7,522	12	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,560	234	1,794	1,794	-	-	-	-	-	-	-	-	-	-

Table C-3
Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1a Period-Dependent Costs (continued)																					
1a.4.7	NRC Fees	-	-	-	-	-	-	175	18	523	523	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	674	67	742	-	742	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	688	69	757	-	757	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	28	4	32	-	32	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	6,411	962	7,373	7,373	-	-	-	-	-	-	-	-	-	115,397
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	19,057	2,859	21,916	21,916	-	-	-	-	-	-	-	-	-	229,871
1a.4	Subtotal Period 1a Period-Dependent Costs	-	993	8	5	-	28	30,637	4,661	36,327	34,797	1,530	-	-	376	-	-	-	7,522	12	345,269
1a.0	TOTAL PERIOD 1a COST	-	993	8	5	-	28	84,138	12,687	97,854	96,135	1,530	188	-	376	-	-	-	7,522	12	378,720
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	172	26	197	178	-	20	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	91	14	104	104	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	49	7	56	44	-	12	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	36	5	42	42	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	132	20	151	151	-	-	-	-	-	-	-	-	-	1,551
1b.1.1.9	Facility closeout	-	-	-	-	-	-	43	7	50	25	-	25	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	16	2	19	19	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	43	7	50	50	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	167	25	192	192	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	36	5	42	21	-	21	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	57	8	65	-	-	65	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	57	8	65	-	-	65	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	89	13	102	-	-	11	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	89	13	102	-	-	11	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,205	181	1,386	1,125	-	261	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	1,655	-	-	-	-	-	-	827	2,482	2,482	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	1,655	-	-	-	-	-	1,205	1,008	3,868	3,608	-	261	-	-	-	-	-	-	1,067	14,228
Period 1b Additional Costs																					
1b.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,554	1,433	10,987	10,987	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	2,809	843	3,651	3,651	-	-	-	-	-	-	-	-	13,042	1,640
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	12,362	2,276	14,638	14,638	-	-	-	-	-	-	-	-	13,042	1,640
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	1,193	-	-	-	-	-	-	179	1,371	1,371	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	79	-	58	90	-	159	-	99	484	484	-	-	-	453	-	-	-	27,199	88	-
1b.3.4	Process decommissioning chemical flush waste	4	-	164	475	-	3,396	-	939	4,978	4,978	-	-	-	-	1,329	-	-	141,637	219	-
1b.3.5	Small tool allowance	-	1	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,400	-	-	-	-	-	210	1,610	1,610	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	2,442	-	-	-	-	-	-	366	2,809	2,809	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	3,718	1,401	222	564	-	3,555	-	1,793	11,254	11,254	-	-	-	453	1,329	-	-	168,836	307	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	29	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	785	78	863	863	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	112	11	123	123	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	315	-	-	-	-	-	79	394	394	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	221	-	-	-	-	-	33	255	255	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	5	8	-	14	-	4	26	26	-	-	-	224	-	-	-	4,188	7	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,580	237	1,817	1,817	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	155	15	170	170	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	341	34	375	-	375	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	393	50	533	-	393	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	14	2	16	-	16	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	3,245	487	3,732	3,732	-	-	-	-	-	-	-	-	-	58,111
1b.4.13	Utility Staff Cost	-	-	-	-	-	-	12,436	1,865	14,302	14,302	-	-	-	-	-	-	-	-	-	149,298

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Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Buriad / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1b.1	Subtotal Period 1b Period-Dependent Costs	29	537	5	8	-	14	19,002	2,904	22,498	21,718	775	-	-	221	-	-	-	4,188	7	207,709
1b.0	TOTAL PERIOD 1b COST	5,402	1,958	227	567	-	3,569	32,569	7,981	52,252	51,217	775	261	-	678	1,329	-	-	178,821	14,153	226,578
PERIOD 1 TOTALS		5,402	2,932	235	571	-	3,592	116,707	20,697	150,106	147,352	2,305	449	-	1,054	1,329	-	-	180,846	14,465	605,297
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	145	146	36	67	-	508	-	250	1,152	1,152	-	-	-	1,789	-	-	-	124,858	6,161	-
2a.1.1.2	Pressurizer Quench Tank	9	7	1	3	-	57	-	22	107	107	-	-	-	201	-	-	-	14,051	375	-
2a.1.1.3	Reactor Coolant Pumps & Motors	125	71	514	421	-	3,755	-	1,133	6,019	6,019	-	-	-	10,637	-	-	-	1,108,000	5,267	100
2a.1.1.4	Pressurizer	-	41	599	114	-	509	-	215	1,478	1,478	-	-	-	2,879	-	-	-	324,870	1,666	625
2a.1.1.5	Steam Generators	257	3,993	8,728	1,351	-	14,379	-	5,797	34,504	34,504	-	-	-	49,515	-	-	-	4,415,357	40,664	1,167
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	136	380	472	144	-	1,357	-	571	3,060	3,060	-	-	-	8,222	-	-	-	333,927	10,981	-
2a.1.1.7	Reactor Vessel Internals	42	7,175	24,173	1,407	-	11,096	458	17,414	61,764	61,764	-	-	-	5,528	678	221	-	587,238	37,973	1,677
2a.1.1.8	Reactor Vessel	105	8,764	4,016	1,570	-	5,469	458	10,825	31,206	31,206	-	-	-	18,058	-	-	-	1,270,178	37,973	1,677
2a.1.1	Totals	818	20,577	38,543	5,081	-	37,181	916	36,226	139,291	139,291	-	-	-	96,830	678	221	-	7,977,878	141,365	5,246
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	119	-	-	-	-	-	18	137	-	-	137	-	-	-	-	-	-	3,424	-
2a.1.3	Main Condensers	-	1,293	1,486	1,301	-	16,955	-	4,906	25,941	25,941	-	-	-	65,575	-	-	-	4,165,812	35,111	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Auxiliary Building	-	184	-	-	-	-	-	28	212	212	-	-	-	-	-	-	-	-	1,303	-
2a.1.4.2	Containment	-	460	-	-	-	-	-	69	529	529	-	-	-	-	-	-	-	-	4,270	-
2a.1.4.3	Main Steam Support Structure	-	36	-	-	-	-	-	5	42	42	-	-	-	-	-	-	-	-	274	-
2a.1.4.4	Radwaste Building	-	178	-	-	-	-	-	27	205	205	-	-	-	-	-	-	-	-	2,104	-
2a.1.4.5	Fuel Building	-	98	-	-	-	-	-	15	113	113	-	-	-	-	-	-	-	-	717	-
2a.1.4	Totals	-	956	-	-	-	-	-	143	1,100	1,100	-	-	-	-	-	-	-	-	8,967	-
Disposal of Plant Systems																					
2a.1.5.1	Auxiliary Feedwater (AF)	-	39	-	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	1,309	-
2a.1.5.2	Auxiliary Steam (AS)	-	41	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	1,500	-
2a.1.5.3	Auxiliary Steam (AS) - RCA	-	177	12	32	-	411	-	156	817	817	-	-	-	1,589	-	-	-	100,889	3,388	-
2a.1.5.4	Auxiliary Steam - Common (AS)	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	3,070	-
2a.1.5.5	CT Makeup & Blowdown (TB)	-	19	4	4	-	48	-	18	92	92	-	-	-	185	-	-	-	11,785	451	-
2a.1.5.6	CT Makeup & Blowdown - Common (TB)	-	769	496	474	-	6,171	-	1,856	9,766	9,766	-	-	-	23,839	-	-	-	1,516,266	20,143	-
2a.1.5.7	Chemical Production (CC)	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	630	-
2a.1.5.8	Chemical Production - Common (CC)	-	55	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,794	-
2a.1.5.9	Chlorine Injection (CI)	-	56	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	1,820	-
2a.1.5.10	Chlorine Injection - Common (CI)	-	20	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	730	-
2a.1.5.11	Circulating Water (CW)	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	3,545	-
2a.1.5.12	Condensate (CD)	-	189	-	-	-	-	-	28	218	-	-	218	-	-	-	-	-	-	6,510	-
2a.1.5.13	Condensate Storage & Transfer (CT)	-	261	39	31	-	408	-	174	908	908	-	-	-	1,542	-	-	-	99,005	6,046	-
2a.1.5.14	Condenser Air Removal (AR)	-	39	-	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	1,316	-
2a.1.5.15	Demineralized Water (DW)	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	2,085	-
2a.1.5.16	Demineralized Water - Common (DW)	-	39	-	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	1,251	-
2a.1.5.17	Diesel Fuel Oil & Trans - Common (DF)	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	287	-
2a.1.5.18	Diesel Fuel Oil & Transfer (DF)	-	49	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	1,192	-
2a.1.5.19	Diesel Generator (DG)	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,362	-
2a.1.5.20	FW Heater Extract Steam & Drains (ED)	-	438	-	-	-	-	-	66	504	-	-	504	-	-	-	-	-	-	11,838	-
2a.1.5.21	Feedwater (FW)	-	93	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	3,094	-
2a.1.5.22	Feedwater (FW) - RCA	-	22	14	13	-	170	-	51	270	270	-	-	-	656	-	-	-	41,735	541	-
2a.1.5.23	Generator Hydrogen & CO2 (GH)	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	102	-
2a.1.5.24	Generator Seal Oil (SO)	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	236	-
2a.1.5.25	HVAC - Misc Site Structures (HS)	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	523	-
2a.1.5.26	HVAC - Miscellaneous Common (HS)	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	115	-
2a.1.5.27	Lube Oil (LO)	-	36	-	-	-	-	-	5	42	-	-	42	-	-	-	-	-	-	1,188	-
2a.1.5.28	Lube Oil Stor & Trans & Purification(OS)	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	1,038	-
2a.1.5.29	Main Steam (SG)	-	232	-	-	-	-	-	35	267	-	-	267	-	-	-	-	-	-	8,052	-
2a.1.5.30	Main Steam (SG) - RCA	-	99	14	37	-	488	-	157	826	826	-	-	-	1,878	-	-	-	119,916	2,297	-
2a.1.5.31	Main Turbine (MT)	-	387	688	617	-	8,044	-	2,269	12,006	12,006	-	-	-	31,043	-	-	-	1,976,452	10,189	-
2a.1.5.32	Main Turbine Control Oil (CO)	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	176	-

Table C-3
Palo Verde NGS Unit 3
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(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2a.1.5.33	Secondary Chemical Control (SC)	-	171	-	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	5,637	-
2a.1.5.34	Sewage Treatment Plant - Common	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	14	-
2a.1.5.35	Stator Cooling (CE)	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	139	-
2a.1.5.36	Steam Gen Feedwater Pump Turbine (FT)	-	192	85	71	-	920	-	297	1,566	1,566	-	-	-	3,530	-	-	-	226,098	4,717	-
2a.1.5.37	Turbine Cooling Water (TC)	-	139	-	-	-	-	-	21	160	-	-	160	-	-	-	-	-	-	4,075	-
2a.1.5.38	Turbine Steam Seal & Drain (GS)	-	114	28	19	-	242	-	94	492	492	-	-	-	927	-	-	-	59,177	2,731	-
2a.1.5	Totals	-	1,090	1,137	1,297	-	16,897	-	5,380	29,101	28,743	-	2,358	-	65,169	-	-	-	4,151,624	120,341	-
2a.1.6	Scaffolding in support of decommissioning	-	3,195	23	20	-	261	-	869	4,368	4,368	-	-	-	1,008	-	-	-	64,051	34,758	-
2a.1	Subtotal Period 2a Activity Costs	818	30,230	11,439	7,699	-	71,243	916	17,542	139,987	137,442	-	2,495	-	228,583	678	221	-	16,359,360	341,265	5,246
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,709	813	3,522	3,522	-	-	-	-	-	-	-	-	40,319	-
2a.2.2	GTCC SFP Legacy Waste	-	339	-	-	-	-	10,550	1,667	12,557	12,557	-	-	-	-	-	-	887	181,103	4,000	160
2a.2	Subtotal Period 2a Additional Costs	-	339	-	-	-	-	13,260	2,480	16,079	16,079	-	-	-	-	-	-	887	181,103	44,319	160
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	136	-	102	156	-	277	-	171	842	842	-	-	-	791	-	-	-	47,168	154	-
2a.3.2	Process decommissioning chemical flush waste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2a.3.3	Small tool allowance	-	271	-	-	-	-	-	41	312	281	-	31	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	136	271	102	156	-	277	-	212	1,154	1,123	-	31	-	791	-	-	-	47,168	154	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	165	-	-	-	-	-	-	11	206	206	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	928	93	1,021	1,021	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	646	65	711	711	-	-	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,965	-	-	-	-	-	1,241	6,206	6,206	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	1,310	-	-	-	-	-	647	1,957	1,957	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	134	75	-	396	-	121	716	716	-	-	-	6,252	-	-	-	125,036	204	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	4,319	648	4,967	4,967	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	831	83	914	914	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,657	166	1,823	-	1,823	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,917	288	2,204	-	2,204	-	-	-	-	-	-	-	-	-
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	82	12	94	-	94	-	-	-	-	-	-	-	-	-
2a.4.12	Security Staff Cost	-	-	-	-	-	-	16,441	2,466	18,907	18,907	-	-	-	-	-	-	-	-	-	294,528
2a.4.13	Utility Staff Cost	-	-	-	-	-	-	76,930	11,539	88,469	88,469	-	-	-	-	-	-	-	-	-	885,989
2a.4	Subtotal Period 2a Period-Dependent Costs	165	3,275	134	75	-	396	103,751	17,410	131,196	127,075	4,121	-	-	6,252	-	-	-	125,036	204	1,180,517
2a.0	TOTAL PERIOD 2a COST	1,119	40,116	11,724	7,930	-	71,906	117,928	67,644	348,386	341,718	1,121	2,526	-	235,626	678	221	887	16,712,970	388,942	1,185,923
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Chemical & Volume Control (CH)	2,017	2,167	494	389	-	5,074	-	2,927	13,068	13,068	-	-	-	19,442	-	-	-	1,246,683	80,047	-
2b.1.1.2	Chemical Waste (CM)	400	496	77	63	-	820	-	546	2,401	2,401	-	-	-	3,149	-	-	-	201,501	18,894	-
2b.1.1.3	Chemical Waste - Common (CM)	90	65	10	9	-	119	-	93	385	385	-	-	-	458	-	-	-	29,130	2,255	-
2b.1.1.4	Containment Building (ZC)	-	1	0	0	-	0	-	0	2	2	-	-	-	2	-	-	-	118	15	-
2b.1.1.5	Containment Hydrogen Control (HP)	-	97	20	15	-	198	-	77	405	405	-	-	-	748	-	-	-	48,116	2,154	-
2b.1.1.6	Containment Leakage Test (CL)	-	31	14	11	-	178	-	56	293	293	-	-	-	690	-	-	-	43,334	312	-
2b.1.1.7	Containment Purge (CP)	-	32	13	11	-	150	-	49	255	255	-	-	-	577	-	-	-	36,798	327	-
2b.1.1.8	Domestic Water (DS)	-	110	-	-	-	-	-	16	126	-	-	126	-	-	-	-	-	-	3,675	-
2b.1.1.9	Domestic Water - Common (DS)	-	82	-	-	-	-	-	12	94	-	-	94	-	-	-	-	-	-	2,761	-
2b.1.1.10	Electrical (Clean)	-	983	-	-	-	-	-	148	1,131	-	-	1,131	-	-	-	-	-	-	30,827	-
2b.1.1.11	Electrical (Clean) - Common	-	77	-	-	-	-	-	12	88	-	-	88	-	-	-	-	-	-	2,107	-
2b.1.1.12	Electrical (Clean) - Common - RCA	-	55	10	9	-	123	-	47	244	244	-	-	-	475	-	-	-	30,159	1,149	-
2b.1.1.13	Electrical (Clean) - RCA	-	758	155	146	-	1,900	-	702	3,661	3,661	-	-	-	7,349	-	-	-	466,835	16,187	-
2b.1.1.14	Electrical (Contaminated)	-	4,397	522	512	-	6,671	-	2,896	14,998	14,998	-	-	-	25,739	-	-	-	1,638,951	97,755	-
2b.1.1.15	Essential Chilled Water (EC)	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	547	-
2b.1.1.16	Essential Chilled Water (EC)-RCA	-	178	32	22	-	281	-	122	637	637	-	-	-	1,082	-	-	-	69,340	3,797	-
2b.1.1.17	Essential Cooling Water (EW)	-	57	-	-	-	-	-	8	65	-	-	65	-	-	-	-	-	-	1,917	-
2b.1.1.18	Essential Cooling Water-(EW)-RCA	-	88	31	27	-	346	-	116	608	608	-	-	-	1,334	-	-	-	85,125	1,997	-
2b.1.1.19	Essential Spray Pond (SP)	-	283	-	-	-	-	-	42	325	-	-	325	-	-	-	-	-	-	9,865	-

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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
2b.1.1.20	Fire Protection (FP)	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	3,645	-
2b.1.1.21	Fire Protection (FP) - RCA	-	557	154	116	-	1,512	-	550	2,890	2,890	-	-	-	5,785	-	-	-	371,572	12,006	-
2b.1.1.22	Fire Protection - Common (FP) - RCA	-	368	137	126	-	1,638	-	534	2,803	2,803	-	-	-	6,326	-	-	-	402,376	7,877	-
2b.1.1.23	Gaseous Radwaste (GR)	-	232	38	27	-	348	-	153	798	798	-	-	-	1,327	-	-	-	85,625	5,181	-
2b.1.1.24	HVAC - Ancillary Building (HN) - Common	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	83	-
2b.1.1.25	HVAC - Auxiliary Building (HA)	-	436	299	211	-	2,756	-	860	4,561	4,561	-	-	-	10,477	-	-	-	677,111	10,352	-
2b.1.1.26	HVAC - Containment Building (HC)	-	461	179	137	-	1,788	-	601	3,166	3,166	-	-	-	6,829	-	-	-	439,260	9,573	-
2b.1.1.27	HVAC - Control Building (HJ)	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	3,112	-
2b.1.1.28	HVAC - Diesel Generator Building (HD)	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	295	-
2b.1.1.29	HVAC - Radwaste (HR)	-	133	42	36	-	471	-	161	843	843	-	-	-	1,812	-	-	-	115,774	2,861	-
2b.1.1.30	HVAC - Turbine Building (HT)	-	160	-	-	-	-	-	24	184	-	-	184	-	-	-	-	-	-	6,322	-
2b.1.1.31	Instrument & Service Air (IA)	-	35	-	-	-	-	-	5	41	-	-	41	-	-	-	-	-	-	1,213	-
2b.1.1.32	Instrument & Service Air (IA) - RCA	-	775	135	78	-	995	-	467	2,448	2,448	-	-	-	3,731	-	-	-	244,352	14,791	-
2b.1.1.33	Liquid Radwaste (LR)	515	766	122	91	-	1,188	-	772	3,455	3,455	-	-	-	4,538	-	-	-	291,979	27,224	-
2b.1.1.34	Normal Chilled Water (WC)	-	69	-	-	-	-	-	10	80	-	-	80	-	-	-	-	-	-	2,362	-
2b.1.1.35	Normal Chilled Water (WC) - RCA	-	210	45	35	-	456	-	176	922	922	-	-	-	1,747	-	-	-	112,038	4,562	-
2b.1.1.36	Nuclear Cooling Water (NC)	-	53	-	-	-	-	-	8	61	-	-	61	-	-	-	-	-	-	1,746	-
2b.1.1.37	Nuclear Cooling Water (NC) - RCA	-	498	260	213	-	2,771	-	875	4,616	4,616	-	-	-	10,647	-	-	-	680,829	11,451	-
2b.1.1.38	Nuclear Sampling (SS)	-	240	30	18	-	231	-	123	643	643	-	-	-	867	-	-	-	56,786	5,121	-
2b.1.1.39	Oily Waste & Nonrad Waste - Common (OW)	-	153	35	33	-	402	-	155	807	807	-	-	-	1,699	-	-	-	109,042	3,462	-
2b.1.1.40	Oily Waste & Nonradioactive Waste (OW)	-	581	78	66	-	857	-	377	1,959	1,959	-	-	-	3,292	-	-	-	210,616	13,291	-
2b.1.1.41	Plant Cooling Water (PW)	-	114	-	-	-	-	-	17	131	-	-	131	-	-	-	-	-	-	3,929	-
2b.1.1.42	Post Accident Sampling	-	11	1	1	-	13	-	6	32	32	-	-	-	50	-	-	-	3,169	275	-
2b.1.1.43	Radiation Monitoring (SQ)	-	33	5	3	-	41	-	20	106	106	-	-	-	167	-	-	-	10,820	782	-
2b.1.1.44	Radioactive Waste Drain (RD)	522	192	62	52	-	675	-	567	2,370	2,370	-	-	-	2,591	-	-	-	165,981	19,157	-
2b.1.1.45	Radioactive Waste Drain - Common (RD)	7	6	1	1	-	8	-	7	28	28	-	-	-	29	-	-	-	1,844	258	-
2b.1.1.46	Reactor Coolant (RC)	26	176	20	12	-	159	-	100	490	490	-	-	-	585	-	-	-	38,217	4,444	-
2b.1.1.47	Safety Injection (SI)	-	1,741	679	528	-	6,851	-	2,295	12,092	12,092	-	-	-	26,194	-	-	-	1,688,405	41,385	-
2b.1.1.48	Service Gases (GA) - RCA	-	218	38	22	-	291	-	134	703	703	-	-	-	1,097	-	-	-	71,538	1,164	-
2b.1.1.49	Solid Radwaste (SR)	182	221	40	31	-	389	-	230	1,054	1,054	-	-	-	1,528	-	-	-	98,132	7,907	-
2b.1.1.50	zDecommissioning Crew Set-up	-	4,163	-	-	-	-	-	624	4,787	-	-	4,787	-	-	-	-	-	-	91,492	-
2b.1.1	Totals	3,709	23,077	3,777	3,050	-	39,742	-	17,754	91,109	83,744	-	7,365	-	152,891	-	-	-	9,764,507	598,509	-
2b.1.2	Scaffolding in support of decommissioning	-	3,994	29	25	-	326	-	1,086	5,459	5,459	-	-	-	1,280	-	-	-	80,061	18,147	-
Decontamination of Site Buildings																					
2b.1.3.1	Auxiliary Building	597	398	74	159	-	986	-	693	2,858	2,858	-	-	-	9,861	-	-	-	488,398	22,059	-
2b.1.3.2	Containment	1,218	1,838	307	840	-	7,685	-	3,146	15,035	15,035	-	-	-	58,640	-	-	-	2,623,131	67,811	-
2b.1.3.3	DAW Processing & Storage (Common)	30	14	1	6	-	25	-	26	102	102	-	-	-	403	-	-	-	13,020	1,010	-
2b.1.3.4	Decon & Laundry Facility (Common)	21	8	6	4	-	17	-	26	112	112	-	-	-	210	-	-	-	12,578	708	-
2b.1.3.5	Holdup Tank & Pump House	352	324	88	47	-	610	-	423	1,841	1,841	-	-	-	2,288	-	-	-	149,929	16,088	-
2b.1.3.6	Hot Instrument Calib Facility (Common)	1	0	0	0	-	1	-	1	3	3	-	-	-	13	-	-	-	610	32	-
2b.1.3.7	LLRW Storage Facility (Common)	41	22	4	10	-	49	-	40	167	167	-	-	-	655	-	-	-	29,706	1,471	-
2b.1.3.8	Outage Support Facility (Common)	124	59	6	27	-	110	-	109	436	436	-	-	-	1,749	-	-	-	82,640	4,229	-
2b.1.3.9	Radwaste Building	846	387	241	165	-	1,863	-	1,085	4,587	4,587	-	-	-	8,651	-	-	-	522,790	22,190	-
2b.1.3.10	Refueling Water Storage Tank	486	395	91	51	-	667	-	525	2,213	2,213	-	-	-	2,496	-	-	-	163,942	21,082	-
2b.1.3	Totals	3,637	3,442	815	1,310	-	12,054	-	5,996	27,304	27,304	-	-	-	84,960	-	-	-	4,092,748	156,675	-
2b.1.4	Prepare/submit License Termination Plan	-	-	-	-	-	-	148	22	171	171	-	-	-	-	-	-	-	-	-	1,753
2b.1.5	Receive NRC approval of termination plan									a											
2b.1	Subtotal Period 2b Activity Costs	7,396	30,512	4,621	4,385	-	52,121	148	24,858	124,043	116,678	-	7,365	-	238,611	-	-	-	13,937,310	798,631	1,753
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	4,278	1,283	5,562	5,562	-	-	-	-	-	-	-	-	63,667	-
2b.2	Subtotal Period 2b Additional Costs	-	-	-	-	-	-	4,278	1,283	5,562	5,562	-	-	-	-	-	-	-	-	63,667	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	312	-	241	371	-	657	-	400	1,982	1,982	-	-	-	1,879	-	-	-	112,757	396	-
2b.3.2	Process decommissioning chemical flush waste	7	-	256	856	-	1,489	-	594	3,180	3,180	-	-	-	2,396	-	-	-	255,343	448	-
2b.3.3	Small tool allowance	-	482	-	-	-	-	-	72	554	554	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	319	482	497	1,227	-	2,146	-	1,066	5,717	5,717	-	-	-	4,276	-	-	-	368,100	845	-

Table C-3
Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	2,355	-	-	-	-	-	-	589	2,944	2,941	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,165	147	1,312	1,312	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	1,020	102	1,122	1,122	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	9,855	-	-	-	-	-	2,464	12,319	12,319	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	6,580	-	-	-	-	-	1,047	8,027	8,027	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	247	188	-	712	-	223	1,320	1,320	-	-	-	11,519	-	-	-	230,374	376	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	5,384	808	6,192	6,192	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,313	131	1,444	1,441	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	2,449	245	2,694	-	2,694	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	3,027	454	3,481	-	3,481	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	763	115	878	878	-	-	-	-	-	-	-	-	-	-
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	129	19	149	-	149	-	-	-	-	-	-	-	-	-
2b.4.13	Security Staff Cost	-	-	-	-	-	-	25,962	3,894	29,857	29,857	-	-	-	-	-	-	-	-	-	165,088
2b.4.14	Utility Staff Cost	-	-	-	-	-	-	117,334	17,600	134,934	134,934	-	-	-	-	-	-	-	-	-	1,347,481
2b.4	Subtotal Period 2b Period-Dependent Costs	2,355	16,435	247	188	-	712	158,847	27,838	206,971	200,648	6,323	-	-	11,519	-	-	-	230,374	376	1,812,569
2b.0	TOTAL PERIOD 2b COST	10,071	47,829	5,404	5,751	-	54,979	168,278	54,985	342,292	328,604	6,323	7,365	-	254,405	-	-	-	14,585,790	368,189	1,811,322
PERIOD 2d - Decontamination Following Wet Fuel Storage																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	321	31	156	70	-	909	-	422	1,908	1,508	-	-	-	3,515	-	-	-	223,325	968	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical Spent Fuel	-	190	37	35	-	457	-	171	889	889	-	-	-	1,766	-	-	-	112,166	1,048	-
2d.1.2.2	Fire Protection - Common (FP)	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	2,334	-
2d.1.2.3	Fuel Pool Cooling & Cleanup (PC)	590	411	163	125	-	1,624	-	824	3,707	3,707	-	-	-	6,204	-	-	-	396,088	13,370	-
2d.1.2.4	HVAC - Fuel Building (HF)	-	173	108	75	-	981	-	310	1,642	1,642	-	-	-	3,738	-	-	-	240,970	8,320	-
2d.1.2.5	Sanitary Drain & Treatment - Common (ST)	-	81	-	-	-	-	-	12	93	-	-	93	-	-	-	-	-	-	2,667	-
2d.1.2.6	Sanitary Drainage & Treatment (ST)	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	577	-
2d.1.2	Totals	590	938	303	235	-	3,072	-	1,329	6,426	6,238	-	189	-	11,706	-	-	-	752,223	26,817	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Building	425	508	61	40	-	484	-	473	1,992	1,992	-	-	-	2,151	-	-	-	128,216	22,125	-
2d.1.3	Totals	425	508	61	40	-	484	-	473	1,992	1,992	-	-	-	2,151	-	-	-	128,216	22,125	-
2d.1.4	Scaffolding in support of decommissioning	-	799	6	5	-	65	-	217	1,092	1,092	-	-	-	252	-	-	-	16,013	8,689	-
2d.1	Subtotal Period 2d Activity Costs	1,306	2,276	526	350	-	4,520	-	2,440	11,418	11,229	-	189	-	17,624	-	-	-	1,119,777	58,600	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	960	288	1,248	1,248	-	-	-	-	-	-	-	-	-	4,160
2d.2.2	Operational Tools & Equipment	-	-	96	125	-	1,323	-	359	1,903	1,903	-	-	-	4,500	-	-	-	325,000	147	-
2d.2.3	Excavation of Underground Services	-	1,159	-	-	-	-	386	348	1,893	1,893	-	-	-	-	-	-	-	-	6,874	-
2d.2.4	Remedial Action Surveys	-	-	-	-	-	-	670	201	871	871	-	-	-	-	-	-	-	-	9,966	-
2d.2	Subtotal Period 2d Additional Costs	-	1,159	96	125	-	1,323	2,015	1,196	5,915	5,915	-	-	-	4,500	-	-	-	325,000	16,986	4,160
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	80	-	62	96	-	170	-	103	512	512	-	-	-	486	-	-	-	29,179	95	-
2d.3.2	Process decommissioning chemical flush waste	2	-	50	261	-	455	-	163	971	971	-	-	-	732	-	-	-	77,960	137	-
2d.3.3	Small tool allowance	-	47	-	-	-	-	-	7	54	54	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	120	105	-	1,368	-	370	1,962	1,962	-	-	-	5,290	-	-	-	336,079	147	-
2d.3	Subtotal Period 2d Collateral Costs	82	47	278	462	-	1,992	-	643	3,500	3,500	-	-	-	6,508	-	-	-	443,218	379	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	134	-	-	-	-	-	-	34	168	168	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	229	23	252	252	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	160	16	176	176	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	999	-	-	-	-	-	250	1,248	1,248	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,093	-	-	-	-	-	164	1,256	1,256	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	36	20	-	105	-	33	195	195	-	-	-	1,702	-	-	-	34,042	56	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	449	67	517	517	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	196	20	216	216	-	-	-	-	-	-	-	-	-	-
2d.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	239	36	275	275	-	-	-	-	-	-	-	-	-	-
2d.4.10	ISFSI Operating Costs	-	-	-	-	-	-	20	3	23	-	23	-	-	-	-	-	-	-	-	-

Table C-3
Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2d Period-Dependent Costs (continued)																					
2d.1.11	Security Staff Cost	-	-	-	-	-	-	1,506	226	1,732	1,103	629	-	-	-	-	-	-	-	-	25,929
2d.1.12	Utility Staff Cost	-	-	-	-	-	-	13,307	1,996	15,303	11,967	337	-	-	-	-	-	-	-	-	147,096
2d.4	Subtotal Period 2d Period-Dependent Costs	134	2,091	36	20	-	105	16,107	2,867	21,361	20,373	989	-	-	1,702	-	-	-	34,042	56	173,025
2d.0	TOTAL PERIOD 2d COST	1,522	5,574	931	958	-	7,940	18,123	7,146	42,193	41,016	989	189	-	30,334	-	-	-	1,922,037	76,020	177,185
PERIOD 2f - License Termination																					
Period 2f Direct Decommissioning Activities																					
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	178	53	231	231	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license									a											
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	178	53	231	231	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																					
2f.2.1	License Termination Survey	-	-	-	-	-	-	9,510	2,853	12,363	12,363	-	-	-	-	-	-	-	-	198,832	2,080
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	9,510	2,853	12,363	12,363	-	-	-	-	-	-	-	-	198,832	2,080
Period 2f Period-Dependent Costs																					
2f.1.1	Insurance	-	-	-	-	-	-	366	37	402	402	-	-	-	-	-	-	-	-	-	-
2f.1.2	Property taxes	-	-	-	-	-	-	255	25	280	280	-	-	-	-	-	-	-	-	-	-
2f.1.3	Health physics supplies	-	1,525	-	-	-	-	-	381	1,906	1,506	-	-	-	-	-	-	-	-	-	-
2f.1.4	Disposal of DAW generated	-	-	7	4	-	21	-	7	39	39	-	-	-	337	-	-	-	6,734	11	-
2f.1.5	Plant energy budget	-	-	-	-	-	-	368	54	412	412	-	-	-	-	-	-	-	-	-	-
2f.1.6	NRC Fees	-	-	-	-	-	-	325	32	357	357	-	-	-	-	-	-	-	-	-	-
2f.1.7	ISFSI Operating Costs	-	-	-	-	-	-	32	5	37	-	37	-	-	-	-	-	-	-	-	-
2f.1.8	Security Staff Cost	-	-	-	-	-	-	2,401	360	2,761	1,759	1,002	-	-	-	-	-	-	-	-	41,338
2f.1.9	Utility Staff Cost	-	-	-	-	-	-	9,016	1,352	10,369	9,964	404	-	-	-	-	-	-	-	-	99,635
2f.1	Subtotal Period 2f Period-Dependent Costs	-	1,525	7	4	-	21	12,758	2,253	16,583	15,119	1,441	-	-	337	-	-	-	6,734	11	140,973
2f.0	TOTAL PERIOD 2f COST	-	1,525	7	4	-	21	22,441	5,160	29,157	27,714	1,441	-	-	337	-	-	-	6,734	198,843	143,053
PERIOD 2 TOTALS		12,712	95,043	48,097	14,642	-	134,846	321,765	134,935	762,008	732,052	12,877	10,080	-	520,702	673	224	887	33,177,520	1,527,294	3,020,485
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Administrative Bldg. A (Common)	-	103	-	-	-	-	-	15	119	-	-	119	-	-	-	-	-	-	1,465	-
3b.1.1.2	Administrative Bldg. B (Common)	-	100	-	-	-	-	-	15	115	-	-	115	-	-	-	-	-	-	1,404	-
3b.1.1.3	Administrative Bldg. D (Common)	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	455	-
3b.1.1.4	Administrative Bldg. E (Common)	-	90	-	-	-	-	-	14	104	-	-	104	-	-	-	-	-	-	1,151	-
3b.1.1.5	Administrative Bldg. F (Common)	-	130	-	-	-	-	-	19	149	-	-	149	-	-	-	-	-	-	1,118	-
3b.1.1.6	Auxiliary Boiler Foundations (Common)	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	56	-
3b.1.1.7	Auxiliary Building	-	1,656	-	-	-	-	-	248	1,904	-	-	1,904	-	-	-	-	-	-	11,728	-
3b.1.1.8	Calibration Lab (Common)	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	15	-
3b.1.1.9	Chemical Injection Pump House	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	65	-
3b.1.1.10	Chemical Storage Building (Common)	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	383	-
3b.1.1.11	Condensate Storage Tank	-	115	-	-	-	-	-	17	132	-	-	132	-	-	-	-	-	-	1,787	-
3b.1.1.12	Containment	-	3,030	-	-	-	-	-	454	3,484	-	-	3,484	-	-	-	-	-	-	25,043	-
3b.1.1.13	Control Building	-	901	-	-	-	-	-	135	1,037	-	-	1,037	-	-	-	-	-	-	9,292	-
3b.1.1.14	Cooling Tower Electrical Equipment	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	135	-
3b.1.1.15	Cooling Towers	-	1,212	-	-	-	-	-	182	1,394	-	-	1,394	-	-	-	-	-	-	7,345	-
3b.1.1.16	Corridor Building	-	74	-	-	-	-	-	11	85	-	-	85	-	-	-	-	-	-	922	-
3b.1.1.17	DAW Processing & Storage (Common)	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	446	-
3b.1.1.18	Decon & Laundry Facility (Common)	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	196	-
3b.1.1.19	Diesel Generator Building	-	307	-	-	-	-	-	46	354	-	-	354	-	-	-	-	-	-	2,158	-
3b.1.1.20	Energy Information Center (Common)	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	334	-
3b.1.1.21	Fire Pumphouse (Common)	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	78	-
3b.1.1.22	Flex Buildings (Common)	-	129	-	-	-	-	-	19	149	-	-	149	-	-	-	-	-	-	1,671	-
3b.1.1.23	Holdup Tank & Pump House	-	41	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	296	-
3b.1.1.24	Hot Instrmnt Calib Facility (Common)	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	19	-
3b.1.1.25	Intake Structure, Canals, & Circ Tunnels	-	1,871	-	-	-	-	-	281	2,152	-	-	2,152	-	-	-	-	-	-	3,859	-
3b.1.1.26	LLRW Storage Facility (Common)	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	352	-
3b.1.1.27	Main Steam Support Structure	-	210	-	-	-	-	-	31	241	-	-	241	-	-	-	-	-	-	1,700	-

Table C-3
Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Demolition of Remaining Site Buildings (continued)																					
3b.1.1.28	Misc. Structures & Foundations (Common)	-	826	-	-	-	-	-	124	950	-	-	950	-	-	-	-	-	-	6,796	-
3b.1.1.29	North Admin Annex Building (Common)	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	675	-
3b.1.1.30	Nuclear Service Spray Ponds	-	1,215	-	-	-	-	-	182	1,398	-	-	1,398	-	-	-	-	-	-	7,151	-
3b.1.1.31	Operations Support Building	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	1,730	-
3b.1.1.32	Outage Support Facility (Common)	-	352	-	-	-	-	-	53	405	-	-	405	-	-	-	-	-	-	2,995	-
3b.1.1.33	Protected Area Sec. Blast Wall (Common)	-	1,211	-	-	-	-	-	182	1,392	-	-	1,392	-	-	-	-	-	-	6,997	-
3b.1.1.34	Radwaste Building	-	1,603	-	-	-	-	-	240	1,843	-	-	1,843	-	-	-	-	-	-	21,638	-
3b.1.1.35	Refueling Water Storage Tank	-	78	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	452	-
3b.1.1.36	Retention Tanks (Common)	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	404	-
3b.1.1.37	SG Voltage Regulator Buildings (Common)	-	11	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	87	-
3b.1.1.38	Security HQ and Guard House (Common)	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	158	-
3b.1.1.39	Service Building (Common)	-	49	-	-	-	-	-	7	56	-	-	56	-	-	-	-	-	-	371	-
3b.1.1.40	Sewage Treatment Plant (Common)	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	13	-
3b.1.1.41	Site Fencing & Paving & RR (Common)	-	603	-	-	-	-	-	91	694	-	-	694	-	-	-	-	-	-	9,840	-
3b.1.1.42	Spare Turbine Rotor Laydown Pads (Com)	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	9	-
3b.1.1.43	Station B/O Gas TB Generator (Common)	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	96	-
3b.1.1.44	Subsynchronous Resonance Protection	-	2	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	30	-
3b.1.1.45	Switchgear Building	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	322	-
3b.1.1.46	Technical Support Center (Common)	-	85	-	-	-	-	-	13	97	-	-	97	-	-	-	-	-	-	513	-
3b.1.1.47	Transformer Area	-	77	-	-	-	-	-	12	89	-	-	89	-	-	-	-	-	-	447	-
3b.1.1.48	Turbine Building	-	2,565	-	-	-	-	-	385	2,950	-	-	2,950	-	-	-	-	-	-	37,106	-
3b.1.1.49	Turbine Building Pedestal	-	3,870	-	-	-	-	-	581	4,451	-	-	4,451	-	-	-	-	-	-	59,425	-
3b.1.1.50	Turbine Maintenance Facility	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	214	-
3b.1.1.51	Vehicle Maintenance Facility (Common)	-	22	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	113	-
3b.1.1.52	WRF Train 7 (Common)	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	7	-
3b.1.1.53	Walsh Furniture Storage Bldg#4 (Common)	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	395	-
3b.1.1.54	Warehouse (Common)	-	329	-	-	-	-	-	49	378	-	-	378	-	-	-	-	-	-	5,516	-
3b.1.1.55	Warehouse - Office Facility (Common)	-	291	-	-	-	-	-	44	335	-	-	335	-	-	-	-	-	-	2,157	-
3b.1.1.56	Yard Tunnels	-	357	-	-	-	-	-	53	410	-	-	410	-	-	-	-	-	-	5,290	-
3b.1.1.57	Fuel Building	-	899	-	-	-	-	-	135	1,034	-	-	1,034	-	-	-	-	-	-	6,910	-
3b.1.1	Totals	-	25,007	-	-	-	-	-	3,751	28,758	-	-	28,758	-	-	-	-	-	-	252,090	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	310	-	-	-	-	-	47	357	-	-	357	-	-	-	-	-	-	8,885	-
3b.1.3	Grade & landscape site	-	63	-	-	-	-	-	9	73	-	-	73	-	-	-	-	-	-	325	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	57	8	65	65	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	25,380	-	-	-	-	57	3,816	29,252	65	-	29,187	-	-	-	-	-	-	261,301	668
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	1,766	-	-	-	-	6	266	2,038	-	-	2,038	-	-	-	-	-	-	7,341	-
3b.2.2	Construction Debris	-	-	-	-	-	-	1,010	152	1,162	-	-	1,162	-	-	-	-	-	-	-	-
3b.2.3	Firing Range Closure	-	87	-	-	-	-	101	28	216	-	-	216	-	-	-	-	-	-	616	-
3b.2	Subtotal Period 3b Additional Costs	-	1,853	-	-	-	-	1,117	445	3,415	-	-	3,415	-	-	-	-	-	-	7,957	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	153	-	-	-	-	-	23	176	-	-	176	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	153	-	-	-	-	-	23	176	-	-	176	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	301	30	332	332	-	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	630	63	693	-	-	693	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,020	-	-	-	-	-	903	6,923	-	-	6,923	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	443	66	510	-	-	510	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	234	23	258	-	258	-	-	-	-	-	-	-	-	-
3b.4.6	ISFSI Operating Costs	-	-	-	-	-	-	80	12	92	-	92	-	-	-	-	-	-	-	-	-
3b.4.7	Security Staff Cost	-	-	-	-	-	-	5,938	891	6,829	-	2,479	4,350	-	-	-	-	-	-	-	102,233
3b.4.8	Utility Staff Cost	-	-	-	-	-	-	13,973	2,096	16,069	-	996	15,073	-	-	-	-	-	-	-	152,367
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,020	-	-	-	-	21,599	4,085	31,704	332	3,824	27,548	-	-	-	-	-	-	-	254,601
3b.0	TOTAL PERIOD 3b COST	-	33,407	-	-	-	-	22,772	8,369	64,547	397	3,824	60,326	-	-	-	-	-	-	269,258	255,268

Table C-3
Palo Verde NGS Unit 3
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

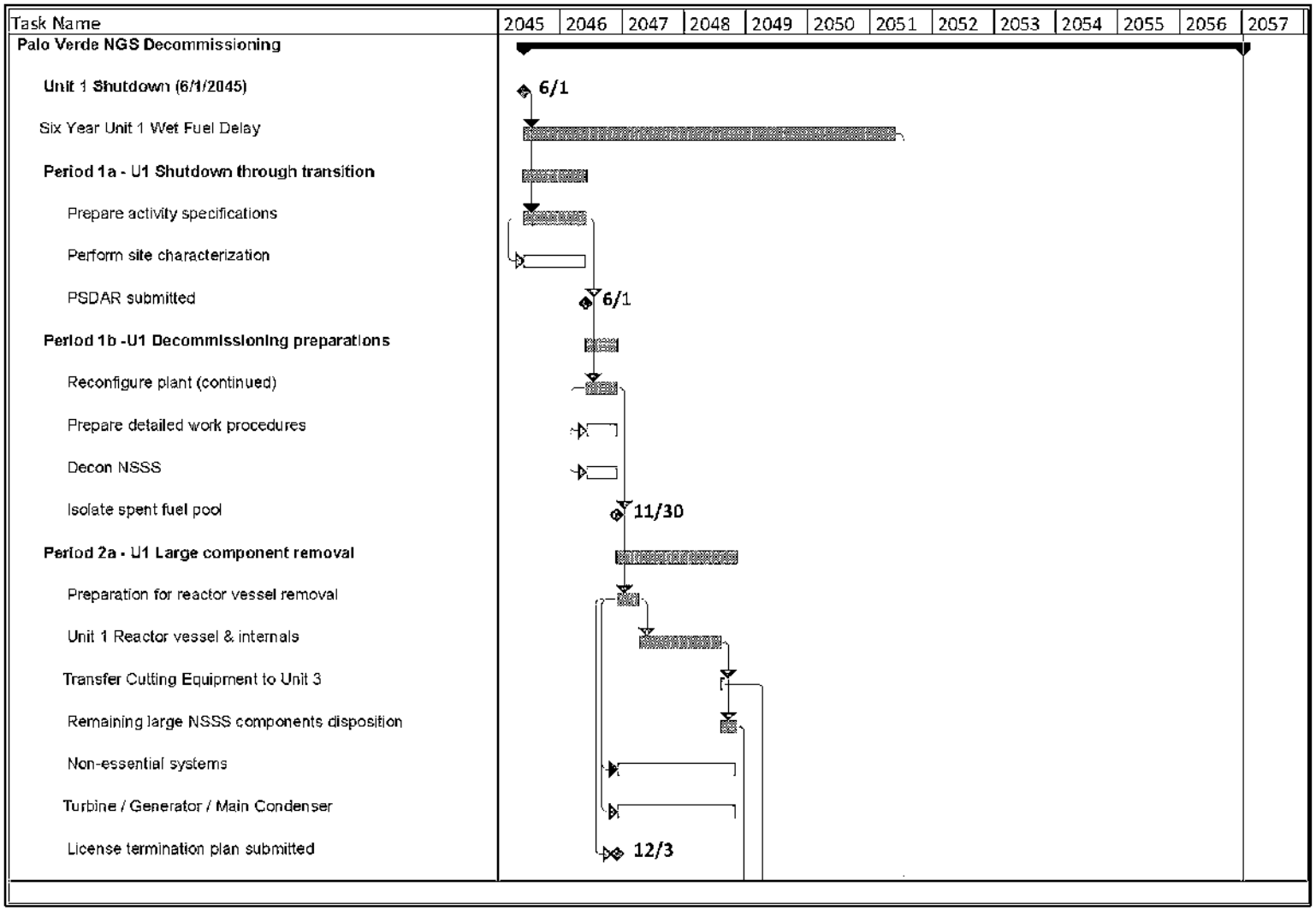
Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,246	-	-	20,402	-	3,372	25,020	25,020	-	-	-	-	-	-	3,547	724,410	-	-
3d.1.1	Totals	-	-	1,246	-	-	20,402	-	3,372	25,020	25,020	-	-	-	-	-	-	3,547	724,110	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,246	-	-	20,402	-	3,372	25,020	25,020	-	-	-	-	-	-	3,547	724,110	-	-
3d.0	TOTAL PERIOD 3d COST	-	-	1,246	-	-	20,402	-	3,372	25,020	25,020	-	-	-	-	-	-	3,547	724,410	-	-
PERIOD 3 TOTALS		-	33,107	1,246	-	-	20,402	22,772	11,710	89,588	25,417	3,821	30,326	-	-	-	-	3,547	724,110	269,258	255,268
TOTAL COST TO DECOMMISSION		18,114	151,381	19,518	15,211	-	158,840	168,350	167,659	1,004,106	911,246	19,006	70,855	-	521,756	2,002	221	4,133	34,082,780	1,811,017	1,215,049

TOTAL COST TO DECOMMISSION WITH 20.01% CONTINGENCY:	**$1,004,106**	**thousands of 2023 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 91.05% OR:	**$914,246**	**thousands of 2023 dollars**
SPENT FUEL MANAGEMENT COST IS 1.89% OR:	**$19,006**	**thousands of 2023 dollars**
NON-NUCLEAR DEMOLITION COST IS 7.06% OR:	**$70,855**	**thousands of 2023 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**523,982**	**Cubic Feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**4,433**	**Cubic Feet**
TOTAL SCRAP METAL REMOVED:	**67,294**	**Tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**1,811,017**	**Man-hours**

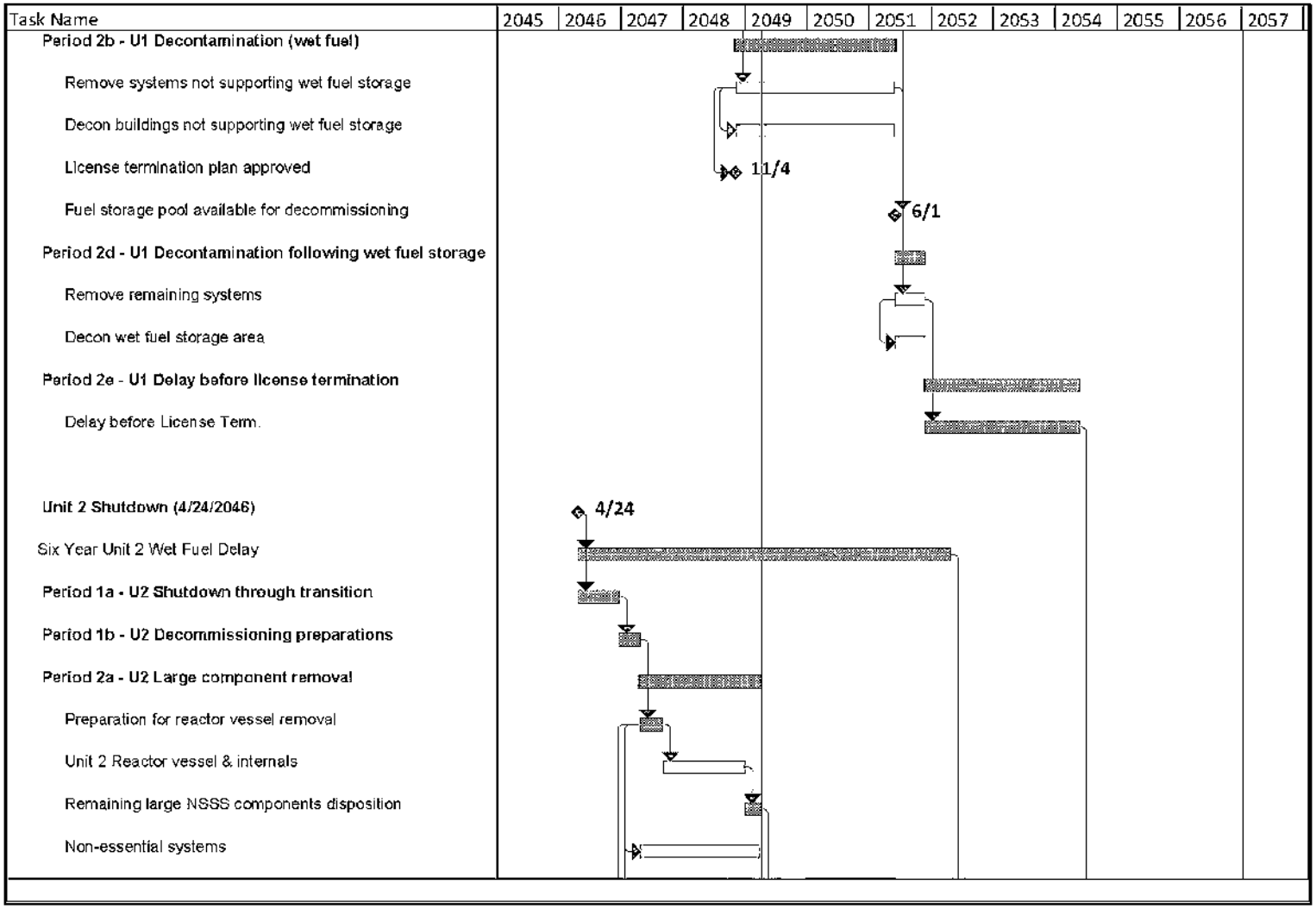
End Notes:
n/a - indicates that this activity not charged as decommissioning expense
a - indicates that this activity performed by decommissioning staff
0 - indicates that this value is less than 0.5 but is non-zero
A cell containing " - " indicates a zero value

APPENDIX D
DECOMMISSIONING SCHEDULE

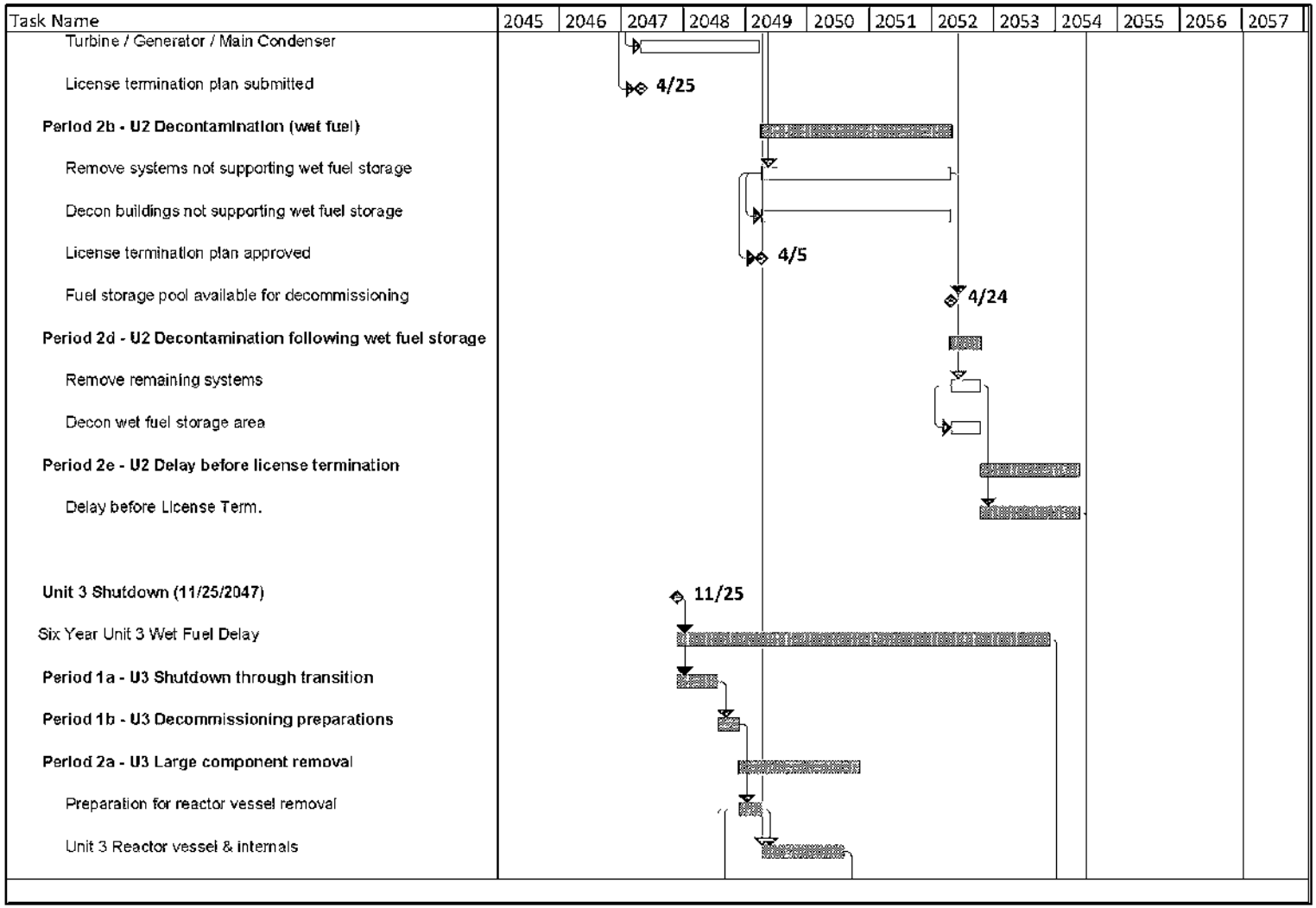
DECOMMISSIONING SCHEDULE



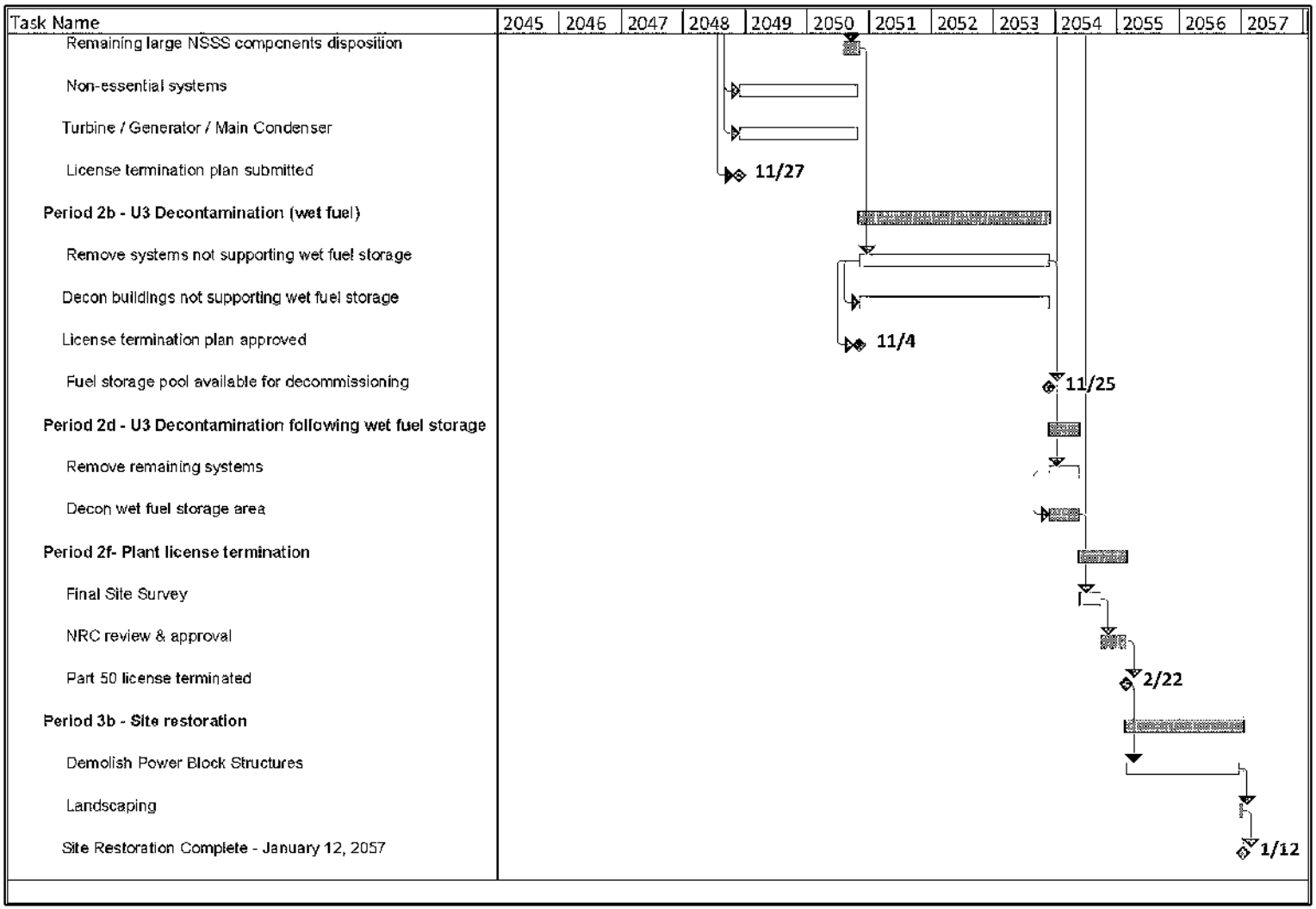
DECOMMISSIONING SCHEDULE
(continued)



DECOMMISSIONING SCHEDULE
(continued)



DECOMMISSIONING SCHEDULE
(continued)



APPENDIX E
UNIT COST FACTOR DEVELOPMENT

APPENDIX E

UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the packing area.

2. CALCULATIONS

Activity Description	Critical Duration (minutes)
Install contamination controls, remove insulation, and mount pipe cutters	60
Disconnect inlet and outlet lines, cap openings	60
Rig for removal	30
Unbolt from mounts	30
Remove contamination controls	15
Remove heat exchanger, wrap in plastic, and send to packing area	60
Critical Duration	255

Work Adjustments (Work Difficulty Factors)

+ Respiratory Protection (50% of Critical Duration)	128
+ Radiation/ALARA (37.08333% of Critical Duration)	95
Adjusted Work Duration	478
+ Protective Clothing (30% of Adjusted Work Duration)	143
Productive Work Duration	621
+ Work break adjustment (8.33 % of Productive Work Duration)	52
Total Work Duration	673

***** Total Work Duration = 673 minutes or 11.217 hours *****

APPENDIX E
(continued)

3. LABOR REQUIRED

Crew	Number	Duration (hours)	Rate ($/hr)	Cost
Laborers	3.00	11.217	$19.78	$665.62
Craftsmen	2.00	11.217	$40.87	$916.88
Foreman	1.00	11.217	$43.95	$492.99
General Foreman	0.25	11.217	$47.02	$131.86
Fire Watch	0.05	11.217	$19.78	$11.09
Health Physics Technician	1.00	11.217	$67.20	$753.78
Total labor cost				$2,972.22

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
-Gas torch consumables 1 @ $23.89/hour x 1 hour {1}	$23.89
-Blotting paper 50 @ $0.81/sq. ft {2}	$40.50
-Tarpaulin 7.5 mils 50 @ $0.49/sq. ft {3}	$23.89
Subtotal cost of equipment and materials	$88.89
Overhead & sales tax on equipment and materials @ 16.300%	$14.49
Total costs, equipment & material	$103.38
TOTAL COST: Removal of contaminated heat exchanger <3000 pounds:	**$3,075.60**
Total labor cost:	$2,972.22
Total equipment/material costs:	$103.38
Total craft labor man-hours required per unit:	81.884

APPENDIX E
(continued)

5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the AIF (now NEI) program to standardize nuclear DCEs and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

- References for equipment & consumables costs:

  1. R.S. Means (2023) Division 01 54 33, Section 40-6360, page 744
  2. www.mcmaster.com online catalog (7193T88)
  3. R.S. Means (2023) Division 01 56, Section 13.60-0600, page 23

- Material and consumable costs were adjusted using the regional indices for Phoenix, Arizona.

APPENDIX F

UNIT COST FACTOR LISTING

(DECON: Power Block Structures Only)

APPENDIX F

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

Unit Cost Factor	Cost/Unit ($)
Removal of clean instrument and sampling tubing, $/linear foot	0.26
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	2.64
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	4.02
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	8.57
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	15.72
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	20.70
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	30.39
Removal of clean pipe >36 inches diameter, $/linear foot	35.99
Removal of clean valve >2 to 4 inches	55.96
Removal of clean valve >4 to 8 inches	85.67
Removal of clean valve >8 to 14 inches	157.16
Removal of clean valve >14 to 20 inches	206.97
Removal of clean valve >20 to 36 inches	303.89
Removal of clean valve >36 inches	359.90
Removal of clean pipe hanger for small bore piping	21.96
Removal of clean pipe hanger for large bore piping	67.44
Removal of clean pump, <300 pound	150.02
Removal of clean pump, 300-1000 pound	426.47
Removal of clean pump, 1000-10,000 pound	1,625.61
Removal of clean pump, >10,000 pound	3,162.98
Removal of clean pump motor, 300-1000 pound	174.06
Removal of clean pump motor, 1000-10,000 pound	669.33
Removal of clean pump motor, >10,000 pound	1,506.00
Removal of clean heat exchanger <3000 pound	884.74
Removal of clean heat exchanger >3000 pound	2,253.62
Removal of clean feedwater heater/deaerator	6,269.39
Removal of clean moisture separator/reheater	12,777.30
Removal of clean tank, <300 gallons	192.34
Removal of clean tank, 300-3000 gallon	595.98
Removal of clean tank, >3000 gallons, $/square foot surface area	5.31

APPENDIX F

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

Unit Cost Factor	Cost/Unit ($)
Removal of clean electrical equipment, <300 pound	77.63
Removal of clean electrical equipment, 300-1000 pound	283.39
Removal of clean electrical equipment, 1000-10,000 pound	566.78
Removal of clean electrical equipment, >10,000 pound	1,380.64
Removal of clean electrical transformer < 30 tons	958.85
Removal of clean electrical transformer > 30 tons	2,761.28
Removal of clean standby diesel generator, <100 kW	979.38
Removal of clean standby diesel generator, 100 kW to 1 MW	2,186.01
Removal of clean standby diesel generator, >1 MW	4,525.49
Removal of clean electrical cable tray, $/linear foot	7.57
Removal of clean electrical conduit, $/linear foot	3.32
Removal of clean mechanical equipment, <300 pound	77.63
Removal of clean mechanical equipment, 300-1000 pound	283.39
Removal of clean mechanical equipment, 1000-10,000 pound	566.78
Removal of clean mechanical equipment, >10,000 pound	1,380.64
Removal of clean HVAC equipment, <300 pound	93.88
Removal of clean HVAC equipment, 300-1000 pound	340.52
Removal of clean HVAC equipment, 1000-10,000 pound	678.65
Removal of clean HVAC equipment, >10,000 pound	1,380.64
Removal of clean HVAC ductwork, $/pound	0.27
Removal of contaminated instrument and sampling tubing, $/linear foot	1.16
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	18.22
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	28.44
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	47.69
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	87.31
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	103.48
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	140.02
Removal of contaminated pipe >36 inches diameter, $/linear foot	163.88
Removal of contaminated valve >2 to 4 inches	349.74
Removal of contaminated valve >4 to 8 inches	413.24

APPENDIX F

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

Unit Cost Factor	Cost/Unit ($)
Removal of contaminated valve >8 to 14 inches	797.55
Removal of contaminated valve >14 to 20 inches	1,004.92
Removal of contaminated valve >20 to 36 inches	1,324.58
Removal of contaminated valve >36 inches	1,563.22
Removal of contaminated pipe hanger for small bore piping	116.25
Removal of contaminated pipe hanger for large bore piping	348.31
Removal of contaminated pump, <300 pound	745.95
Removal of contaminated pump, 300-1000 pound	1,694.80
Removal of contaminated pump, 1000-10,000 pound	4,922.34
Removal of contaminated pump, >10,000 pound	11,983.18
Removal of contaminated pump motor, 300-1000 pound	764.12
Removal of contaminated pump motor, 1000-10,000 pound	2,050.31
Removal of contaminated pump motor, >10,000 pound	4,603.62
Removal of contaminated heat exchanger <3000 pound	3,075.60
Removal of contaminated heat exchanger >3000 pound	9,061.63
Removal of contaminated tank, <300 gallons	1,250.38
Removal of contaminated tank, >300 gallons, $/square foot	23.01
Removal of contaminated electrical equipment, <300 pound	552.46
Removal of contaminated electrical equipment, 300-1000 pound	1,340.61
Removal of contaminated electrical equipment, 1000-10,000 pound	2,584.07
Removal of contaminated electrical equipment, >10,000 pound	5,087.72
Removal of contaminated electrical cable tray, $/linear foot	26.80
Removal of contaminated electrical conduit, $/linear foot	14.25
Removal of contaminated mechanical equipment, <300 pound	613.87
Removal of contaminated mechanical equipment, 300-1000 pound	1,477.78
Removal of contaminated mechanical equipment, 1000-10,000 pound	2,843.69
Removal of contaminated mechanical equipment, >10,000 pound	5,087.72
Removal of contaminated HVAC equipment, <300 pound	613.87
Removal of contaminated HVAC equipment, 300-1000 pound	1,477.78
Removal of contaminated HVAC equipment, 1000-10,000 pound	2,843.69

APPENDIX F

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

Unit Cost Factor	Cost/Unit ($)
Removal of contaminated HVAC equipment, >10,000 pound	5,087.72
Removal of contaminated HVAC ductwork, $/pound	1.90
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	2.79
Additional decontamination of surface by washing, $/square foot	5.75
Additional decontamination of surfaces by hydrolasing, $/square foot	27.91
Decontamination rig hook up and flush, $/ 250 foot length	5,121.11
Chemical flush of components/systems, $/gallon	32.73
Removal of clean standard reinforced concrete, $/cubic yard	69.22
Removal of grade slab concrete, $/cubic yard	78.61
Removal of clean concrete floors, $/cubic yard	316.76
Removal of sections of clean concrete floors, $/cubic yard	885.85
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	99.49
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	1,736.18
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	134.65
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	2,293.51
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	437.15
Removal of below-grade suspended floors, $/cubic yard	188.48
Removal of clean monolithic concrete structures, $/cubic yard	709.46
Removal of contaminated monolithic concrete structures, $/cubic yard	1,716.90
Removal of clean foundation concrete, $/cubic yard	563.04
Removal of contaminated foundation concrete, $/cubic yard	1,600.61
Explosive demolition of bulk concrete, $/cubic yard	41.47
Removal of clean hollow masonry block wall, $/cubic yard	27.46
Removal of contaminated hollow masonry block wall, $/cubic yard	72.65
Removal of clean solid masonry block wall, $/cubic yard	27.46
Removal of contaminated solid masonry block wall, $/cubic yard	72.65
Backfill of below-grade voids, $/cubic yard	38.55
Removal of subterranean tunnels/voids, $/linear foot	80.12
Placement of concrete for below-grade voids, $/cubic yard	185.04
Excavation of clean material, $/cubic yard	2.79
Excavation of contaminated material, $/cubic yard	39.19

APPENDIX F

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

Unit Cost Factor	Cost/Unit ($)
Removal of clean concrete rubble (tipping fee included), $/cubic yard	26.77
Removal of contaminated concrete rubble, $/cubic yard	24.60
Removal of building by volume, $/cubic foot	0.33
Removal of clean building metal siding, $/square foot	0.97
Removal of contaminated building metal siding, $/square foot	3.99
Removal of standard asphalt roofing, $/square foot	1.21
Removal of transite panels, $/square foot	1.71
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	11.82
Scabbling contaminated concrete floors, $/square foot	6.45
Scabbling contaminated concrete walls, $/square foot	16.34
Scabbling contaminated ceilings, $/square foot	55.40
Scabbling structural steel, $/square foot	5.51
Removal of clean overhead crane/monorail < 10 ton capacity	420.46
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,434.98
Removal of clean overhead crane/monorail >10-50 ton capacity	1,009.10
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,443.37
Removal of polar crane > 50 ton capacity	4,292.23
Removal of gantry crane > 50 ton capacity	15,417.13
Removal of structural steel, $/pound	0.23
Removal of clean steel floor grating, $/square foot	3.58
Removal of contaminated steel floor grating, $/square foot	11.56
Removal of clean free standing steel liner, $/square foot	7.96
Removal of contaminated free standing steel liner, $/square foot	26.65
Removal of clean concrete-anchored steel liner, $/square foot	3.98
Removal of contaminated concrete-anchored steel liner, $/square foot	31.11
Placement of scaffolding in clean areas, $/square foot	14.87
Placement of scaffolding in contaminated areas, $/square foot	22.86
Landscaping with topsoil, $/acre	27,847.98
Cost of CPC B-88 LSA box & preparation for use	2,263.59
Cost of CPC B-25 LSA box & preparation for use	1,928.18

APPENDIX F

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

Unit Cost Factor	Cost/Unit ($)
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,738.44
Cost of CPC B-144 LSA box & preparation for use	11,549.73
Cost of LSA drum & preparation for use	370.00
Cost of cask liner for CNSI 8 120A cask (resins)	15,409.10
Cost of cask liner for CNSI 8 120A cask (filters)	10,826.94
Decontamination of surfaces with vacuuming, $/square foot	0.68

APPENDIX G

STORED STEAM GENERATORS & STORAGE FACILITY, DECON DECOMMISSIONING COST ESTIMATE

Table G
Palo Verde NGS - Stored Steam Generators & Storage Facility
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
Activity Specifications																					
1	Review plant dwgs & specs.	-	-	-	-	-	-	39	6	45	45	-	-	-	-	-	-	-	-	-	400
2	Define major work sequence	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	750
3	Steam generators	-	-	-	-	-	-	26	4	30	30	-	-	-	-	-	-	-	-	-	312
4	Reinforced concrete	-	-	-	-	-	-	14	2	16	16	-	-	-	-	-	-	-	-	-	160
5	Plant structures & buildings	-	-	-	-	-	-	26	4	30	15	-	15	-	-	-	-	-	-	-	312
6	Facility & site closeout	-	-	-	-	-	-	8	1	9	4	-	4	-	-	-	-	-	-	-	90
Planning & Site Preparations																					
7	Prepare dismantling sequence	-	-	-	-	-	-	20	3	23	23	-	-	-	-	-	-	-	-	-	240
8	Plant prep. & temp. svces	-	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-	-	-	-	-
Detailed Work Procedures																					
9	Remaining buildings	-	-	-	-	-	-	11	2	13	13	-	-	-	-	-	-	-	-	-	135
10	Facility closeout	-	-	-	-	-	-	10	2	12	12	-	-	-	-	-	-	-	-	-	120
11	Steam generators	-	-	-	-	-	-	39	6	45	45	-	-	-	-	-	-	-	-	-	460
12	Reinforced concrete	-	-	-	-	-	-	8	1	10	10	-	-	-	-	-	-	-	-	-	100
Nuclear Steam Supply System Removal																					
13	Retired Steam Generator Units	-	-	26,185	4,052	-	42,642	-	13,887	86,767	86,767	-	-	-	146,958	-	-	-	13,246,071	107,355	2,250
Demolition of Remaining Site Buildings																					
14	Steam Generator Storage Facility	-	185	-	-	-	-	-	28	212	-	-	212	-	-	-	-	-	-	1,087	-
Site Closeout Activities																					
15	Remove Rubble	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	387	-
16	Concrete Crushing	-	30	-	-	-	-	2	5	36		-	36	-	-	-	-	-	-	125	
17	Small tool allowance	-	275	-	-	-	-	-	41	316	-	-	316	-	-	-	-	-	-	-	-
TOTAL COST TO DECOMMISSION		-	565	26,185	4,052	-	42,642	667	14,072	88,185	87,513	-	672	-	146,958	-	-	-	13,246,071	108,954	5,389

TOTAL COST TO DECOMMISSION WITH 18.99 % CONTINGENCY:	**$88,185**	**thousands of 2023 dollars**
TOTAL NRC LICENSE TERMINATION COST	**$87,513**	**thousands of 2023 dollars**
NON-NUCLEAR DEMOLITION COST	**$672**	**thousands of 2023 dollars**
TOTAL SCRAP METAL REMOVED:	**222**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**108,954**	**man-hours**

APPENDIX H

WATER RECLAMATION FACILITY, DECON DECOMMISSIONING COST ESTIMATE

Table H
Palo Verde NGS - Water Reclamation Facility
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
Activity Specifications																					
1	Operations Shutdown	-	-	-	-	-	-	1,369	-	1,369	-	-	1,369	-	-	-	-	-	-	-	
2	Review plant dwgs & specs.	-	-	-	-	-	-	39	6	45	-	-	45	-	-	-	-	-	-	-	460
3	Define major work sequence	-	-	-	-	-	-	64	10	73	-	-	73	-	-	-	-	-	-	-	750
4	Plant & temporary facilities	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	492
5	Plant systems	-	-	-	-	-	-	35	5	41	-	-	41	-	-	-	-	-	-	-	417
6	Reinforced concrete	-	-	-	-	-	-	14	2	16	-	-	16	-	-	-	-	-	-	-	160
7	Plant structures & buildings	-	-	-	-	-	-	26	4	30	-	-	30	-	-	-	-	-	-	-	312
8	Facility & site closeout	-	-	-	-	-	-	8	1	9	-	-	9	-	-	-	-	-	-	-	90
Planning & Site Preparations		-	-	-	-	-	-														
9	Prepare dismantling sequence	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	240
10	Plant prep. & temp. sycss	-	-	-	-	-	-	400	60	460	-	-	460	-	-	-	-	-	-	-	-
Detailed Work Procedures																					
11	Plant systems	-	-	-	-	-	-	40	6	46	-	-	46	-	-	-	-	-	-	-	473
12	Remaining buildings	-	-	-	-	-	-	11	2	13	-	-	13	-	-	-	-	-	-	-	135
13	Facility closeout	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	120
14	Reinforced concrete	-	-	-	-	-	-	8	1	10	-	-	10	-	-	-	-	-	-	-	100
Disposal of Plant Systems																					
15.1	Chlorination	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	81	-
15.2	Clarifier Feed Sump	-	21	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	674	-
15.3	Classification Centrifuge	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	53	-
15.4	Dewatering Centrifuge	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	101	-
15.5	Domestic Water	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	55	-
15.6	Fire Protection	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	68	-
15.7	First Stage Thickeners	-	111	-	-	-	-	-	17	128	-	-	128	-	-	-	-	-	-	3,214	-
15.8	Fuel Oil	-	37	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	1,076	-	
15.9	Gravity Filters	-	1	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	33	-	
15.10	LPG	-	10	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	278	-	
15.11	Lime	-	193	-	-	-	-	29	221	-	-	221	-	-	-	-	-	-	5,643	-	
15.12	Lime Recalcination	-	6	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	193	-	
15.13	Polymer	-	21	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	625	-	
15.14	Process Water	-	21	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	674	-	
15.15	Pure Carbon Dioxide	-	35	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	1,008	-	
15.16	Second Stage Thickeners	-	38	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	1,098	-	
15.17	Soda Ash	-	130	-	-	-	-	20	150	-	-	150	-	-	-	-	-	-	3,790	-	
15.18	Solids Contact Clarifiers	-	89	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,788	-	
15.19	Spent Washwater Pump Station	-	13	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	405	-	
15.20	Spent Washwater Thickeners	-	178	-	-	-	-	27	205	-	-	205	-	-	-	-	-	-	5,155	-	
15.21	Stack Gas CO2	-	7	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	213	-	
15.22	Sulfuric Acid	-	19	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	544	-	
15.23	Supply	-	28	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	892	-	
15.24	Trickling Filters	-	996	-	-	-	-	149	1,146	-	-	1,146	-	-	-	-	-	-	28,757	-	
15.25	Waste Centrifuge	-	1	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	37	-	
15.26	Waste Thickeners	-	71	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	2,071	-	
15	Totals		2,039	-	-	-	-	306	2,345	-	-	2,345	-	-	-	-	-	-	59,524	-	
16	Scaffolding in support of decommissioning	-	83	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	3,460	-	
17	Small tool allowance	-	21	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	630	-	
Demolition of Remaining Site Buildings																					
18.1	1st & 2nd Stage Solids Contact Clarifier	-	567	-	-	-	-	85	652	-	-	652	-	-	-	-	-	-	8,704	-	
18.2	1st & 2nd Stage Thickeners	-	61	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	458	-	
18.3	Air Compressor	-	12	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	129	-	
18.4	Carbon Dioxide Tank	-	9	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	63	-	
18.5	Chemical Feed Area	-	39	-	-	-	-	6	45	-	-	45	-	-	-	-	-	-	369	-	
18.6	Chemical Production Building	-	121	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	1,724	-	
18.7	Chlorine Building	-	7	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	83	-	
18.8	Clarifier & Thickener Walkway	-	173	-	-	-	-	26	198	-	-	198	-	-	-	-	-	-	2,250	-	
18.9	Classification & Dewatering Centrifuge	-	59	-	-	-	-	9	68	-	-	68	-	-	-	-	-	-	788	-	
18.10	Diesel Fuel Tanks	-	2	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	12	-	
18.11	Electrical Building	-	16	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	220	-	
18.12	Electrical Equipment Bldg & Foundations	-	97	-	-	-	-	14	111	-	-	111	-	-	-	-	-	-	930	-	
18.13	Filters & Clarifiers Pump Station	-	39	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	401	-	
18.14	Gravity Filters	-	175	-	-	-	-	26	202	-	-	202	-	-	-	-	-	-	1,618	-	
18.15	I & C Shop	-	16	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	220	-	
18.16	LPG Storage Tank	-	10	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	62	-	
18.17	Lime Storage	-	89	-	-	-	-	13	103	-	-	103	-	-	-	-	-	-	773	-	
18.18	Operations Building	-	172	-	-	-	-	26	197	-	-	197	-	-	-	-	-	-	2,515	-	
18.19	Piping	-	766	-	-	-	-	115	881	-	-	881	-	-	-	-	-	-	1,333	-	
18.20	Recalcinating Furnace Area	-	79	-	-	-	-	12	90	-	-	90	-	-	-	-	-	-	1,275	-	

Table H
Palo Verde NGS - Water Reclamation Facility
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
18.21	Soda Ash Unloading & Storage	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	140	-
18.22	Spent Washwater Thickeners	-	250	-	-	-	-	-	37	287	-	-	287	-	-	-	-	-	-	1,999	-
18.23	Sulfuric Acid Building	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	457	-
18.24	TSDEMS/CDDC Building	-	42	-	-	-	-	-	6	48	-	-	48	-	-	-	-	-	-	521	-
18.25	Trickling Filter-Walkways	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	96	-
18.26	Trickling Filters	-	683	-	-	-	-	-	102	785	-	-	785	-	-	-	-	-	-	1,666	-
18.27	WRF Warehouse	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	1,580	-
18.28	Waste Centrifuges	-	55	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	740	-
18.29	Waste Thickeners	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	260	-
18	Totals	-	3,747	-	-	-	-	-	562	4,309	-	-	4,309	-	-	-	-	-	-	29,335	-
Site Closeout Activities																					
19	Concrete Crushing	-	258	-	-	-	-	14	41	313	-	-	313	-	-	-	-	-	-	1,073	-
20	Backfill Site	-	3,127	-	-	-	-	-	469	3,597	-	-	3,597	-	-	-	-	-	-	1,868	-
21	Grade & landscape site	-	68	-	-	-	-	-	9	78	-	-	78	-	-	-	-	-	-	325	-
22	Small tool allowance	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	-	-
TOTAL COST TO DECOMMISSION		-	9,872	-	-	-	-	3,101	1,515	12,988	-	-	12,988	-	-	-	-	-	-	99,215	3,749

TOTAL COST TO DECOMMISSION WITH 13.21 % CONTINGENCY:	**$12,988**	**thousands of 2023 dollars**
TOTAL NRC LICENSE TERMINATION COST	**$ -**	**thousands of 2023 dollars**
NON-NUCLEAR DEMOLITION COST	**$ 12,988**	**thousands of 2023 dollars**
TOTAL SCRAP METAL REMOVED:	**10,415**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**99,215**	**man-hours**

APPENDIX I

WATER RECLAMATION SUPPLY SYSTEM PIPELINE & STRUCTURES, DECON DECOMMISSIONING COST ESTIMATE

Table I
Palo Verde NGS - Water Reclamation Supply System Pipeline & Structures
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
Activity Specifications																					
1	Review plant dwgs & specs.	-	-	-	-	-	-	39	6	45	-	-	45	-	-	-	-	-	-	-	460
2	Define major work sequence	-	-	-	-	-	-	64	10	73	-	-	73	-	-	-	-	-	-	-	750
3	Plant & temporary facilities	-	-	-	-	-	-	42	6	48	-	-	48	-	-	-	-	-	-	-	492
4	Plant systems	-	-	-	-	-	-	35	5	41	-	-	41	-	-	-	-	-	-	-	417
5	Reinforced concrete	-	-	-	-	-	-	14	2	16	-	-	16	-	-	-	-	-	-	-	160
6	Plant structures & buildings	-	-	-	-	-	-	26	4	30	-	-	30	-	-	-	-	-	-	-	312
7	Facility & site closeout	-	-	-	-	-	-	8	1	9	-	-	9	-	-	-	-	-	-	-	90
Planning & Site Preparations																					
8	Prepare dismantling sequence	-	-	-	-	-	-	20	3	23	-	-	23	-	-	-	-	-	-	-	240
9	Plant prep. & temp. sycss	-	-	-	-	-	-	400	60	460	-	-	460	-	-	-	-	-	-	-	-
Detailed Work Procedures																					
10	Plant systems	-	-	-	-	-	-	40	6	46	-	-	46	-	-	-	-	-	-	-	478
11	Remaining buildings	-	-	-	-	-	-	11	2	13	-	-	13	-	-	-	-	-	-	-	135
12	Facility closeout	-	-	-	-	-	-	10	2	12	-	-	12	-	-	-	-	-	-	-	120
13	Reinforced concrete	-	-	-	-	-	-	8	1	10	-	-	10	-	-	-	-	-	-	-	100
Disposal of Plant Systems																					
14.1	91st Avenue Meter Vault Components	-	3	-	-	-	-	-	0.5	4	-	-	4	-	-	-	-	-	-	110	-
14.2	Chemical Waste	-	3	-	-	-	-	-	0.4	3	-	-	3	-	-	-	-	-	-	82	-
14.3	Fire Protection	-	0.2	-	-	-	-	-	0.02	0.2	-	-	0.2	-	-	-	-	-	-	5	-
14.4	HVAC-Misc Site Structures	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	166	-
14	Totals	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	363	-
15	Scaffolding in support of decommissioning	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	769	-
16	Small tool allowance	-	0.11	-	-	-	-	-	0.017	0.131	-	-	0.131	-	-	-	-	-	-	-	
Demolition of Remaining Site Buildings																					
17.1	91st Avenue Meter Vault	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	126	-
17.2	91st Avenue Interface	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	406	-
17.3	BIC Interface	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	60	-
17.4	Buckeye Isolation Valve Structure	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	51	-
17.5	Hassayampa Isolation Valve Structure	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	24	-
17.6	Hassayampa Pumping Station	-	155	-	-	-	-	-	23	178	-	-	178	-	-	-	-	-	-	1,223	-
17.7	Influent Shutoff Valve Structure	-	1	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	37	-
17.8	Piping	-	64,021	-	-	-	-	-	9,603	73,624	-	-	73,624	-	-	-	-	-	-	111,544	-
17.9	RID Sump Structures	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	66	-
17.10	Tolleson Interface Structures	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	89	-
17	Totals	-	64,290	-	-	-	-	-	9,644	73,934	-	-	73,934	-	-	-	-	-	-	113,676	-
Site Closeout Activities																					
18	Backfill Site	-	480	-	-	-	-	-	72	552	-	-	552	-	-	-	-	-	-	747	
19	Concrete Crushing	-	24	-	-	-	-	1	4	30	-	-	30	-	-	-	-	-	-	102	
20	Small tool allowance	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	-	-
TOTAL COST TO DECOMMISSION		-	64,892	-	-	-	-	719	9,842	75,452	-	-	75,452	-	-	-	-	-	-	115,656	3,749

TOTAL COST TO DECOMMISSION WITH 15 % CONTINGENCY:	**$75,452**	**thousands of 2023 dollars**
TOTAL NRC LICENSE TERMINATION COST	**$ -**	**thousands of 2023 dollars**
NON-NUCLEAR DEMOLITION COST	**$ 75,452**	**thousands of 2023 dollars**
TOTAL SCRAP METAL REMOVED:	**558**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**115,656**	**man-hours**

APPENDIX J

EVAPORATION PONDS, DECON DECOMMISSIONING COST ESTIMATE

Table J
Palo Verde NGS - Evaporation Ponds
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs1	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1	**Subtitle D Permitted Landfill (On Site)**																				
1.1	Total Direct Cost							14,319	2,864	17,183			17,183								
1.2	Engineering							357	71	428			428								
1.3	Construction Quality Assurance							1,070	214	1,283			1,283								
1.4	Construction Mobilization and Demobilization @ 8%							430	86	515			515								
1.5	APS Management Personnel Costs @ 10%							1,432	286	1,718			1,718								
1.6	Other Construction Items @ 15%							2,148	430	2,577			2,577								
	Total Subtitle D Permitted Landfill							19,755	3,951	23,706			23,706								
2	**Evaporation Pond #1**																				
2.1	Excavation, Hauling and Disposal of sludge/sediment							3,712	742	4,454			4,454								
2.2	Removal of Composite Liner System							3,798	760	4,558			4,558								
2.3	Removal of Inflow Piping System							22	4	26			26								
2.4	Cut Down Sumps, Soil Backfill							31	6	37			37								
2.5	Haul and Disposal of Composite Liner System and Inflow Piping System							1,590	318	1,908			1,908								
2.6	Confirmation Sampling							77	15	92			92								
2.7	Fill Pond Area in with Embankment Material, Regrade and Compact							3,568	714	4,281			4,281								
2.8	Revegetation							1,381	276	1,657			1,657								
2.9	Grouting of LCRS pipes							29	6	35			35								
2.10	Disposal of Concrete Structures							16	3	19			19								
	Subtotal Direct Activities							14,223	2,845	17,067			17,067								
2.11	Construction Mobilization and Demobilization @ 3%							427	85	512			512								
2.12	APS Management Personnel Costs @ 10%							1,422	284	1,707			1,707								
	Total Evaporation Pond #1							16,071	3,214	19,286			19,286								
3	**Evaporation Pond #2**																				
3.1	Excavation, Hauling and Disposal of sludge/sediment							3,404	680	4,157			4,157								
3.2	Removal of Composite Liner System							3,482	696	4,178			4,178								
3.3	Removal of Inflow Piping System							22	4	26			26								
3.4	Cut Down Sumps, Soil Backfill							62	12	74			74								
3.5	Haul and Disposal of Composite Liner System and Inflow Piping System							1,467	293	1,761			1,761								
3.6	Confirmation Sampling							77	15	92			92								
3.7	Fill Pond Area in with Embankment Material, Regrade and Compact							3,223	645	3,867			3,867								
3.8	Revegetation							1,266	253	1,519			1,519								
3.9	Grouting of LCRS pipes							62	12	74			74								
3.10	Disposal of Concrete Structures							28	6	33			33								
	Subtotal Direct Activities							13,152	2,630	15,782			15,782								
3.11	Construction Mobilization and Demobilization @ 3%							395	79	473			473								
3.12	APS Management Personnel Costs @ 10%							1,315	263	1,578			1,578								
	Total Evaporation Pond #2							14,861	2,972	17,834			17,834								
4	**Evaporation Pond #3**																				
4.1	Excavation, Hauling and Disposal of sludge/sediment							2,769	554	3,322			3,322								
4.2	Removal of Composite Liner System							1,231	246	1,477			1,477								
4.3	Removal of Inflow Piping System							-	-	-			-								
4.4	Cut Down Sumps, Soil Backfill							62	12	74			74								
4.5	Haul and Disposal of Composite Liner System and Inflow Piping System							529	106	635			635								
4.6	Confirmation Sampling							77	15	92			92								
4.7	Fill Pond Area in with Embankment Material, Regrade and Compact							5,900	1,200	7,100			7,100								
4.8	Revegetation							1,015	203	1,218			1,218								
4.9	Grouting of LCRS pipes							62	12	74			74								
4.10	Disposal of Concrete Structures							24	5	28			28								
	Subtotal Direct Activities							11,765	2,353	14,118			14,118								
4.11	Construction Mobilization and Demobilization @ 5%							588	118	706			706								
4.12	APS Management Personnel Costs @ 10%							1,177	235	1,412			1,412								
	Total Evaporation Pond #3							13,530	2,706	16,236			16,236								
TOTAL COST TO DECOMMISSION								64,218	12,844	77,061			77,061								

Table J
Palo Verde NGS - Evaporation Ponds
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs1	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
TOTAL COST TO DECOMMISSION WITH 20% CONTINGENCY:					$77,061	thousands of 2023 dollars															
TOTAL NRC LICENSE TERMINATION COST					$ -	thousands of 2023 dollars															
NON-NUCLEAR DEMOLITION COST					$ 77,061	thousands of 2023 dollars															

Note 1: The Evaporation Pond closure and Subtitle D Permitted Landfill cost estimates were provided by APSC.
TLG assumes that the costs provided for development of the permitted landfill and closure of the Evaporation Ponds to be all-inclusive
TLG escalated the Evaporation Pond closure costs from 2007 & 2009 S's, to 2023 dollars.
The Subtitle D Permitted Landfill costs were provided based upon waste volumes after 60 years of plant operation. Direct costs were reduced by 33% to reflect 40 years of operation.

APPENDIX K

MAKE-UP WATER RESERVOIR, DECON DECOMMISSIONING COST ESTIMATE

Table K
Palo Verde NGS - Make-up Water Reservoir
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs1	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1	**80 Acre Make-up Water Reservoir**																				
1.1	Excavation, Hauling and Disposal of sludge/sediment							1,346	269	1,615			1,615								
1.2	Removal of Composite Liner System							92	18	111			111								
1.3	Cut Down Sumps, Soil Backfill							185	37	221			221								
1.4	Haul and Disposal of Composite Liner System and Inflow Piping System							185	37	221			221								
1.5	Confirmation Sampling							46	9	55			55								
1.6	Revegetation							505	101	605			605								
1.7	Restoration of 36" Red Hawk Make-Up Water Line[2]							1,226	245	1,471			1,471								
	Subtotal Direct Activities							3,584	717	4,300			4,300								
1.8	Construction Mobilization and Demobilization @ 5%							179	35.84	215			215								
1.9	APS Management Personnel Costs @ 10%							358	72	430			430								
	Total 80 Acre Make-up Water Reservoir							4,121	824	4,945			4,945								
2	**45 Acre Make-up Water Reservoir**																				
2.1	Excavation, Hauling and Disposal of sludge/sediment							352	70	422			422								
2.2	Removal of Composite Liner System							228	46	273			273								
2.3	Cut Down Sumps, Soil Backfill							83	17	99			99								
2.4	Haul and Disposal of Composite Liner System and Inflow Piping System							117	23	140			140								
2.5	Confirmation Sampling							25	5	30			30								
2.6	Revegetation							149	30	178			178								
	Subtotal Direct Activities							952	190	1,143			1,143								
2.7	Construction Mobilization and Demobilization @ 5%							48	10	57			57								
2.8	APS Management Personnel Costs @ 10%							95	19	114			114								
	Total 45 Acre Make-up Water Reservoir							1,095	219	1,314			1,314								
	TOTAL COST TO DECOMMISSION							5,216	1,043	6,259			6,259								

TOTAL COST TO DECOMMISSION WITH 20% CONTINGENCY:	**$6,259**	**thousands of 2023 dollars**
TOTAL NRC LICENSE TERMINATION COST	**$ -**	**thousands of 2023 dollars**
NON-NUCLEAR DEMOLITION COST	**$ 6,259**	**thousands of 2023 dollars**

TOTAL SCRAP METAL REMOVED:

TOTAL CRAFT LABOR REQUIREMENTS:

Note 1 The Make-up Water Reservoir closure cost estimates with the exception of line #1.7 were provided by APSC. TLG escalated these costs to 2023 dollars.
Note 2 TLG estimated the closure cost of the 36" makeup water line from the Red Hawk pipeline to the Make-up Water Reservoirs

APPENDIX L

ISFSI
DECON DECOMMISSIONING COST ESTIMATE

Table L
Palo Verde NGS - ISFSI
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
	ISFSI Operations / Spent Fuel Transfer (Unit 1, 2, & 3 Shutdown - End of Spent Fuel Transfer to DOE																				
Start:	**Unit 1 - June 1, 2045**																				
	Unit 2 - April 24, 2046																				
	Unit 3 - November 25, 2047																				
Finish:	**December 31, 2097**																				
	ISFSI Operations																				
	Spent Fuel Capital and Transfer Costs																				
	Spent Fuel Transfer from Pad to DOE Transport Vehicle	-	-	-	-	-	-	24,805	3,646	27,951	-	27,951	-	-	-	-	-	-	-	-	-
	Spent Fuel Transfer from ISFSI to DOE Transport Vehicle	-	-	-	-	-	-	47,519	7,128	54,647	-	54,647	-	-	-	-	-	-	-	-	-
	Spent Fuel Transfer from Pad to ISFSI	-	-	-	-	-	-	8,102	1,215	9,317	-	9,317	-	-	-	-	-	-	-	-	-
	Spent Fuel Canistors & Overpacks	-	-	-	-	-	-	52,800	7,920	60,720	-	60,720	-	-	-	-	-	-	-	-	-
	Subtotal Spent Fuel Capital and Transfer Costs							132,725	19,909	152,634	-	152,634	-	-	-	-	-	-	-	-	-
	Period-Dependent Costs																				
	ISFSI Insurance	-	-	-	-	-	-	19,611	1,961	21,572	-	21,572	-	-	-	-	-	-	-	-	-
	ISFSI Property Taxes	-	-	-	-	-	-	40,969	4,097	45,066	-	45,066	-	-	-	-	-	-	-	-	-
	ISFSI Licensing Fees	-	-	-	-	-	-	15,236	1,524	16,760	-	16,760	-	-	-	-	-	-	-	-	-
	ISFSI Operating Costs	-	-	-	-	-	-	5,188	778	5,966	-	5,966	-	-	-	-	-	-	-	-	-
	ISFSI Oversight Staff	-	-	-	-	-	-	56,112	8,417	64,528	-	64,528	-	-	-	-	-	-	-	-	575,602
	ISFSI Security	-	-	-	-	-	-	140,100	21,015	161,115	-	161,115	-	-	-	-	-	-	-	-	2,387,680
	Subtotal Period-Dependent Costs							277,216	37,792	315,007	-	315,007	-	-	-	-	-	-	-	-	2,963,282
	Total ISFSI Operations Costs	-	-	-	-	-	-	409,941	57,700	467,642	-	467,642	-	-	-	-	-	-	-	-	2,963,282
	Radiological ISFSI License Termination																				
	ISFSI License Termination																				
	ISFSI Planning	-	-	-	-	-	-	937	234	1,171	-	1,171	-	-	-	-	-	-	-	-	1,672
	ISFSI Decontamination	-	272	536	1,820	-	8,268	-	2,734	13,631	-	13,631	-	-	48,798	-	-	-	4,855,432	2,789	-
	ISFSI License Termination	-	-	-	-	-	-	5,421	1,355	6,776	-	6,776	-	-	-	-	-	-	-	83,820	-
	NRC and NRC Contractor	-	-	-	-	-	-	583	146	729	-	729	-	-	-	-	-	-	-	-	1,153
	Subtotal ISFSI License Termination Costs	-	272	536	1,820	-	8,268	6,941	4,469	22,296	-	22,296	-	-	48,798	-	-	-	-	-	2,825
	Period-Dependent Costs																				
	ISFSI Insurance	-	-	-	-	-	-	97	24	121	-	121	-	-	-	-	-	-	-	-	-
	ISFSI Property Taxes	-	-	-	-	-	-	413	103	517	-	517	-	-	-	-	-	-	-	-	-
	Plant Energy Budget	-	-	-	-	-	-	19	5	24	-	24	-	-	-	-	-	-	-	-	-
	ISFSI Security	-	-	-	-	-	-	868	92	460	-	460	-	-	-	-	-	-	-	-	6,239
	ISFSI Oversight Staff	-	-	-	-	-	-	485	121	606	-	606	-	-	-	-	-	-	-	-	4,733
	Subtotal Period-Dependent Costs							1382	346	1728	0	1728	-	-	-	-	-	-	-	-	10,971
	Total Radiological ISFSI License Termination Costs	-	272	536	1,820	-	8,268	8,323	4,805	24,024	-	24,024	-	-	48,798	-	-	-	4,855,432	36,609	13,796
	Non-Radiological ISFSI Demolition and Site Restoration																				
	Demolition of Remaining Site Buildings & Site Closure (Including, rail track, paving, buildings, storage casks liners, and ISFSI pad)	-	10,533	-	-	-	-	2,080	1,891.84	14,504	-	14,504	-	-	-	-	-	-	-	75,935	160
	Period-Dependent Costs																				
	ISFSI Property Taxes	-	-	-	-	-	-	164	25	189	-	189	-	-	-	-	-	-	-	-	-
	Plant Energy Budget	-	-	-	-	-	-	8	1	9	-	9	-	-	-	-	-	-	-	-	-
	ISFSI Security	-	-	-	-	-	-	146	22	168	-	168	-	-	-	-	-	-	-	-	2,479
	ISFSI Oversight Staff	-	-	-	-	-	-	164	25	188	-	188	-	-	-	-	-	-	-	-	1,539
	Subtotal Period-Dependent Costs	-	-	-	-	-	-	482	72	554	-	554	-	-	-	-	-	-	-	-	4,018
	TOTAL Non-Radiological ISFSI Demolition and Site Restoration Cost	-	10,533	-	-	-	-	2,562	1,964	15,058	-	15,058	-	-	-	-	-	-	-	75,935	4,178
	TOTAL COST TO DECOMMISSION	-	10,805	536	1,820	-	8,268	420,826	64,469	506,724	-	506,724	-	-	48,798	-	-	-	4,855,432	112,544	2,981,256

Table L
Palo Verde NGS - ISFSI
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
TOTAL COST TO OPERATE AND DECOMMISSION ISFSI WITH 14.8% CONTINGENCY:					$506,724 thousands of 2023 dollars																
TOTAL CRAFT LABOR REQUIREMENTS:					112,544 Man-hours																

APPENDIX M

STORED REACTOR CLOSURE HEADS & STORAGE FACILITY, DECON DECOMMISSIONING COST ESTIMATE

Table M
Palo Verde NGS - Stored Reactor Closure Heads & Storage Facility
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt. Lbs.	Craft Manhours	Utility and Contractor Manhours
Activity Specifications																					
1	Review plant dwgs & specs.	-	-	-	-	-	-	39	6	45	45	-	-	-	-	-	-	-	-	-	400
2	Define major work sequence	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	750
3	Reactor Vessel	-	-	-	-	-	-	55	8	63	63	-	-	-	-	-	-	-	-	-	650
4	Reinforced concrete	-	-	-	-	-	-	14	2	16	8	-	8	-	-	-	-	-	-	-	160
5	Plant structures & buildings	-	-	-	-	-	-	26	4	30	15	-	15	-	-	-	-	-	-	-	312
6	Facility & site closeout	-	-	-	-	-	-	8	1	9	4	-	4	-	-	-	-	-	-	-	90
Planning & Site Preparations																					
7	Prepare dismantling sequence	-	-	-	-	-	-	20	3	23	23	-	-	-	-	-	-	-	-	-	240
8	Plant prep. & temp. svces	-	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-	-	-	-	-
Detailed Work Procedures																					
9	Remaining buildings	-	-	-	-	-	-	11	2	13	3	-	10	-	-	-	-	-	-	-	135
10	Facility closeout	-	-	-	-	-	-	10	2	12	6	-	6	-	-	-	-	-	-	-	120
11	Reactor Vessel	-	-	-	-	-	-	31	5	35	35	-	-	-	-	-	-	-	-	-	363
12	Reinforced concrete	-	-	-	-	-	-	8	1	10	5	-	5	-	-	-	-	-	-	-	100
Nuclear Steam Supply System Removal																					
13	Retired Reactor Closure Heads	-	-	577	1,745	-	5,093	-	1,593	9,007	9,007	-	-	-	15,216	-	-	-	924,428	6,295	6,000
Demolition of Remaining Site Buildings																					
14	Rx Closure Head Storage Facility	-	52	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	304	-
Site Closeout Activities																					
15	Remove Rubble	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	108	-
16	Concrete Crushing	-	8	-	-	-	-	0	1	10	10	-	-	-	-	-	-	-	-	35	-
17	Small tool allowance	-	6	-	-	-	-	-	1	7	7	-	1	-	-	-	-	-	-	-	-
TOTAL COST TO DECOMMISSION		-	88	577	1,745	-	5,093	687	1,709	9,898	9,765	-	182	-	15,216	-	-	-	924,428	6,742	9,880

TOTAL COST TO DECOMMISSION WITH 20.9 % CONTINGENCY:	$	9,898	thousands of 2023 dollars
TOTAL NRC LICENSE TERMINATION COST	$	9,765	thousands of 2023 dollars
NON-NUCLEAR DEMOLITION COST	$	132	thousands of 2023 dollars
TOTAL SCRAP METAL REMOVED:		62	tons
TOTAL CRAFT LABOR REQUIREMENTS:		6,742	man-hours

APPENDIX N

ISFSI CAMPAIGN COSTS
DECON DECOMMISSIONING COST ESTIMATE

Table N
Palo Verde NGS - ISFSI Campaign Costs
DECON Decommissioning Cost Estimate
(Thousands of 2023 Dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
	ISFSI Operations / Spent Fuel Transfer (Unit 1, 2, & 3 Shutdown - End of Spent Fuel Transfer to DOE)																				
Start:	**Unit 1 - June 1, 2045**																				
	Unit 2 - April 24, 2046																				
	Unit 3 - November 25, 2047																				
Finish:	**December 31, 2097**																				
ISFSI Operations Collateral / Period Dependent Costs																					
	ISFSI Transfer Equipment							8,488	1,272	9,756	-	9,756									
	Instrument Remaining Five ISFSI Pads							848	127	976	-	976									
	Installation of ISFSI Shield Wall							1,841	276	2,117	-	2,117									
	Relocate Unit 1 Crane to ISFSI							3,380	509	3,902	-	3,902									
	Total ISFSI Operations / Spent Fuel Transfer Costs	-	-	-	-	-	-	14,565	2,185	16,750	-	16,750	-	-	-	-	-	-	-	-	-
TOTAL COST TO DECOMMISSION		-	-	-	-	-	-	14,565	2,185	16,750	-	16,750	-	-	-	-	-	-	-	-	-

TOTAL COST TO OPERATE AND DECOMMISSION ISFSI WITH 15% CONTINGENCY:	$16,750	thousands of 2023 dollars
TOTAL CRAFT LABOR REQUIREMENTS:	-	Man-hours

APPENDIX O

SCHEDULE OF ANNUAL EXPENDITURES - CONSOLIDATED

TABLE O-1
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	136	0	0	0	0	136
2041	231	0	0	0	0	231
2042	231	0	0	0	0	231
2043	601	0	0	0	0	601
2044	867	0	0	0	0	867
2045	74,122	5,703	1,580	28	3,877	85,309
2046	98,347	24,071	4,035	18,557	25,266	170,276
2047	75,737	43,724	2,561	58,591	15,963	196,575
2048	73,191	37,979	2,482	45,291	13,574	172,516
2049	58,456	18,086	2,021	26,691	6,550	111,804
2050	58,605	18,534	2,021	26,691	6,550	112,402
2051	45,008	24,211	1,353	20,966	5,953	97,490
2052	8,035	6,695	0	8	2,029	16,766
2053	9,084	7,596	0	8	2,023	18,711
2054	36,228	5,443	335	24	1,815	43,845
2055	32,902	16,376	308	5	1,446	51,037
2056	18,622	16,028	270	0	1,410	36,330
2057	2,496	853	8	0	769	4,126
2058	1,969	403	0	0	727	3,099
2059	1,969	403	0	0	727	3,099
2060	1,969	403	0	0	727	3,099
2061	1,969	403	0	0	727	3,099
2062	1,969	403	0	0	727	3,099
2063	1,954	358	0	0	727	3,039
2064	1,954	358	0	0	727	3,039
2065	1,954	358	0	0	727	3,039
2066	1,969	403	0	0	727	3,099
2067	1,969	403	0	0	727	3,099
2068	1,969	403	0	0	727	3,099
2069	1,924	269	0	0	727	2,919

TABLE O-1 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	1,969	403	0	0	727	3,099
2071	1,939	314	0	0	727	2,979
2072	1,924	269	0	0	727	2,919
2073	1,909	224	0	0	727	2,860
2074	1,924	269	0	0	727	2,919
2075	1,909	224	0	0	727	2,860
2076	1,924	269	0	0	727	2,919
2077	1,909	224	0	0	727	2,860
2078	1,924	269	0	0	727	2,919
2079	1,924	269	0	0	727	2,919
2080	1,924	269	0	0	727	2,919
2081	1,924	269	0	0	727	2,919
2082	1,909	224	0	0	727	2,860
2083	1,909	224	0	0	727	2,860
2084	1,909	224	0	0	727	2,860
2085	1,924	269	0	0	727	2,919
2086	1,924	269	0	0	727	2,919
2087	1,924	269	0	0	727	2,919
2088	1,924	269	0	0	727	2,919
2089	1,924	269	0	0	727	2,919
2090	1,924	269	0	0	727	2,919
2091	1,909	224	0	0	727	2,860
2092	1,909	224	0	0	727	2,860
2093	1,909	224	0	0	727	2,860
2094	1,924	269	0	0	727	2,919
2095	1,924	269	0	0	727	2,919
2096	1,939	314	0	0	727	2,979
2097	1,939	1,872	0	0	24,189	27,999
2098	4,820	2,677	11	3,445	2,074	13,028

TABLE O-1 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	675,085	241,492	16,987	200,303	141,822	1,275,690

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

TABLE O-2
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	136	0	0	0	0	136
2041	231	0	0	0	0	231
2042	231	0	0	0	0	231
2043	601	0	0	0	0	601
2044	867	0	0	0	0	867
2045	5,380	4,143	0	0	0	9,522
2046	93,859	9,338	1,927	10,300	6,112	121,537
2047	74,746	42,602	3,441	56,357	24,365	201,514
2048	78,920	43,415	2,568	61,648	15,568	202,118
2049	61,766	22,897	2,156	32,161	8,279	127,259
2050	56,310	16,632	2,021	22,424	5,872	103,261
2051	59,043	24,832	2,021	22,424	5,872	114,193
2052	37,587	17,645	1,148	16,928	5,136	78,444
2053	9,084	7,596	0	8	1,864	18,552
2054	36,228	5,443	335	24	1,584	43,614
2055	32,863	16,377	308	5	1,407	50,960
2056	18,576	16,029	270	0	1,410	36,286
2057	2,495	853	8	0	769	4,125
2058	1,969	403	0	0	727	3,099
2059	1,969	403	0	0	727	3,099
2060	1,969	403	0	0	727	3,099
2061	1,969	403	0	0	727	3,099
2062	1,969	403	0	0	727	3,099
2063	1,954	358	0	0	727	3,039
2064	1,954	358	0	0	727	3,039
2065	1,954	358	0	0	727	3,039
2066	1,969	403	0	0	727	3,099
2067	1,969	403	0	0	727	3,099
2068	1,969	403	0	0	727	3,099
2069	1,924	269	0	0	727	2,919

TABLE O-2 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	1,969	403	0	0	727	3,099
2071	1,939	314	0	0	727	2,979
2072	1,924	269	0	0	727	2,919
2073	1,909	224	0	0	727	2,860
2074	1,924	269	0	0	727	2,919
2075	1,909	224	0	0	727	2,860
2076	1,924	269	0	0	727	2,919
2077	1,909	224	0	0	727	2,860
2078	1,924	269	0	0	727	2,919
2079	1,924	269	0	0	727	2,919
2080	1,924	269	0	0	727	2,919
2081	1,924	269	0	0	727	2,919
2082	1,909	224	0	0	727	2,860
2083	1,909	224	0	0	727	2,860
2084	1,909	224	0	0	727	2,860
2085	1,924	269	0	0	727	2,919
2086	1,924	269	0	0	727	2,919
2087	1,924	269	0	0	727	2,919
2088	1,924	269	0	0	727	2,919
2089	1,924	269	0	0	727	2,919
2090	1,924	269	0	0	727	2,919
2091	1,909	224	0	0	727	2,860
2092	1,909	224	0	0	727	2,860
2093	1,909	224	0	0	727	2,860
2094	1,924	269	0	0	727	2,919
2095	1,924	269	0	0	727	2,919
2096	1,939	314	0	0	727	2,979
2097	1,939	1,872	0	0	24,189	27,999
2098	4,820	2,677	11	3,445	2,074	13,028

TABLE O-2 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	651,110	243,996	16,219	225,724	132,837	1,269,887

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

TABLE O-3
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	136	0	0	0	0	136
2041	231	0	0	0	0	231
2042	231	0	0	0	0	231
2043	601	0	0	0	0	601
2044	867	0	0	0	0	867
2045	5,380	4,143	0	0	0	9,522
2046	2,237	6,567	0	9,945	1,111	19,860
2047	15,283	4,879	273	9,949	1,721	32,105
2048	107,189	18,761	3,597	9,399	18,448	157,395
2049	76,477	41,209	2,561	48,473	14,598	183,318
2050	75,384	37,638	2,473	44,264	13,188	172,949
2051	71,674	24,996	2,021	22,437	5,874	127,003
2052	70,397	20,649	2,027	22,498	5,890	121,461
2053	69,204	21,517	1,926	22,261	5,804	120,713
2054	52,015	10,724	743	7,848	2,841	74,171
2055	32,882	16,438	308	5	1,407	51,040
2056	18,599	16,100	270	0	1,410	36,380
2057	2,496	855	8	0	769	4,128
2058	1,969	403	0	0	727	3,099
2059	1,969	403	0	0	727	3,099
2060	1,969	403	0	0	727	3,099
2061	1,969	403	0	0	727	3,099
2062	1,969	403	0	0	727	3,099
2063	1,954	358	0	0	727	3,039
2064	1,954	358	0	0	727	3,039
2065	1,954	358	0	0	727	3,039
2066	1,969	403	0	0	727	3,099
2067	1,969	403	0	0	727	3,099
2068	1,969	403	0	0	727	3,099
2069	1,924	269	0	0	727	2,919

TABLE O-3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	1,969	403	0	0	727	3,099
2071	1,939	314	0	0	727	2,979
2072	1,924	269	0	0	727	2,919
2073	1,909	224	0	0	727	2,860
2074	1,924	269	0	0	727	2,919
2075	1,909	224	0	0	727	2,860
2076	1,924	269	0	0	727	2,919
2077	1,909	224	0	0	727	2,860
2078	1,924	269	0	0	727	2,919
2079	1,924	269	0	0	727	2,919
2080	1,924	269	0	0	727	2,919
2081	1,924	269	0	0	727	2,919
2082	1,909	224	0	0	727	2,860
2083	1,909	224	0	0	727	2,860
2084	1,909	224	0	0	727	2,860
2085	1,924	269	0	0	727	2,919
2086	1,924	269	0	0	727	2,919
2087	1,924	269	0	0	727	2,919
2088	1,924	269	0	0	727	2,919
2089	1,924	269	0	0	727	2,919
2090	1,924	269	0	0	727	2,919
2091	1,909	224	0	0	727	2,860
2092	1,909	224	0	0	727	2,860
2093	1,909	224	0	0	727	2,860
2094	1,924	269	0	0	727	2,919
2095	1,924	269	0	0	727	2,919
2096	1,939	314	0	0	727	2,979
2097	1,939	1,872	0	0	24,189	27,999
2098	4,820	2,677	11	3,445	2,074	13,028

TABLE O-3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	683,472	240,670	16,219	200,524	127,661	1,268,546

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

APPENDIX P

SCHEDULE OF ANNUAL EXPENDITURES - CONSOLIDATED 25% CONTINGENCY*

* Calculated with 25% contingency as required to comply with the California Public Utility Commission as detailed in "Technical Position Paper for Establishing an Appropriate Contingency Factor for Inclusion in the Decommissioning Revenue Requirements", Study Number: DECON-POS-II002, Revision B

TABLE P-1
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	140	0	0	0	0	140
2041	239	0	0	0	0	239
2042	239	0	0	0	0	239
2043	621	0	0	0	0	621
2044	895	0	0	0	0	895
2045	76,579	5,936	1,632	29	3,972	88,147
2046	101,788	25,307	4,167	19,628	26,048	176,938
2047	78,905	46,083	2,644	62,050	16,496	206,178
2048	76,247	40,093	2,563	47,911	14,019	180,833
2049	60,738	18,954	2,087	28,024	6,739	116,541
2050	60,901	19,443	2,087	28,024	6,739	117,194
2051	46,968	25,777	1,397	22,013	6,122	102,277
2052	8,415	7,252	0	8	2,075	17,751
2053	9,520	8,239	0	8	2,070	19,837
2054	38,339	5,796	346	25	1,856	46,363
2055	34,709	17,055	318	5	1,485	53,571
2056	19,309	16,623	279	0	1,449	37,661
2057	2,697	905	8	0	819	4,429
2058	2,152	441	0	0	775	3,368
2059	2,152	441	0	0	775	3,368
2060	2,152	441	0	0	775	3,368
2061	2,152	441	0	0	775	3,368
2062	2,152	441	0	0	775	3,368
2063	2,136	392	0	0	775	3,303
2064	2,136	392	0	0	775	3,303
2065	2,136	392	0	0	775	3,303
2066	2,152	441	0	0	775	3,368
2067	2,152	441	0	0	775	3,368
2068	2,152	441	0	0	775	3,368
2069	2,104	294	0	0	775	3,172

TABLE P-1 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	2,152	441	0	0	775	3,368
2071	2,120	343	0	0	775	3,238
2072	2,104	294	0	0	775	3,172
2073	2,087	245	0	0	775	3,107
2074	2,104	294	0	0	775	3,172
2075	2,087	245	0	0	775	3,107
2076	2,104	294	0	0	775	3,172
2077	2,087	245	0	0	775	3,107
2078	2,104	294	0	0	775	3,172
2079	2,104	294	0	0	775	3,172
2080	2,104	294	0	0	775	3,172
2081	2,104	294	0	0	775	3,172
2082	2,087	245	0	0	775	3,107
2083	2,087	245	0	0	775	3,107
2084	2,087	245	0	0	775	3,107
2085	2,104	294	0	0	775	3,172
2086	2,104	294	0	0	775	3,172
2087	2,104	294	0	0	775	3,172
2088	2,104	294	0	0	775	3,172
2089	2,104	294	0	0	775	3,172
2090	2,104	294	0	0	775	3,172
2091	2,087	245	0	0	775	3,107
2092	2,087	245	0	0	775	3,107
2093	2,087	245	0	0	775	3,107
2094	2,104	294	0	0	775	3,172
2095	2,104	294	0	0	775	3,172
2096	2,120	343	0	0	775	3,238
2097	2,120	1,979	0	0	25,001	29,100
2098	5,387	2,976	12	3,937	2,328	14,641

TABLE P-1 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	707,218	255,149	17,541	211,662	147,448	1,339,019

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

TABLE P-2
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	140	0	0	0	0	140
2041	238	0	0	0	0	238
2042	238	0	0	0	0	238
2043	619	0	0	0	0	619
2044	893	0	0	0	0	893
2045	5,597	4,313	0	0	0	9,910
2046	96,735	9,803	1,985	10,921	6,273	125,718
2047	77,521	44,646	3,548	59,369	25,098	210,180
2048	82,004	45,643	2,645	64,880	16,046	211,217
2049	64,031	23,992	2,221	33,740	8,515	132,498
2050	58,321	17,402	2,082	23,457	6,028	107,290
2051	61,308	26,361	2,082	23,457	6,028	119,236
2052	39,061	18,668	1,183	17,708	5,270	81,890
2053	9,507	8,239	0	8	1,904	19,657
2054	38,263	5,789	345	25	1,618	46,040
2055	34,614	17,022	317	5	1,442	53,400
2056	19,218	16,587	278	0	1,446	37,529
2057	2,694	904	8	0	819	4,425
2058	2,152	441	0	0	775	3,368
2059	2,152	441	0	0	775	3,368
2060	2,152	441	0	0	775	3,368
2061	2,152	441	0	0	775	3,368
2062	2,152	441	0	0	775	3,368
2063	2,136	392	0	0	775	3,303
2064	2,136	392	0	0	775	3,303
2065	2,136	392	0	0	775	3,303
2066	2,152	441	0	0	775	3,368
2067	2,152	441	0	0	775	3,368
2068	2,152	441	0	0	775	3,368
2069	2,104	294	0	0	775	3,172

TABLE P-2 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	2,152	441	0	0	775	3,368
2071	2,120	343	0	0	775	3,238
2072	2,104	294	0	0	775	3,172
2073	2,087	245	0	0	775	3,107
2074	2,104	294	0	0	775	3,172
2075	2,087	245	0	0	775	3,107
2076	2,104	294	0	0	775	3,172
2077	2,087	245	0	0	775	3,107
2078	2,104	294	0	0	775	3,172
2079	2,104	294	0	0	775	3,172
2080	2,104	294	0	0	775	3,172
2081	2,104	294	0	0	775	3,172
2082	2,087	245	0	0	775	3,107
2083	2,087	245	0	0	775	3,107
2084	2,087	245	0	0	775	3,107
2085	2,104	294	0	0	775	3,172
2086	2,104	294	0	0	775	3,172
2087	2,104	294	0	0	775	3,172
2088	2,104	294	0	0	775	3,172
2089	2,104	294	0	0	775	3,172
2090	2,104	294	0	0	775	3,172
2091	2,087	245	0	0	775	3,107
2092	2,087	245	0	0	775	3,107
2093	2,087	245	0	0	775	3,107
2094	2,104	294	0	0	775	3,172
2095	2,104	294	0	0	775	3,172
2096	2,120	343	0	0	775	3,238
2097	2,120	1,973	0	0	24,942	29,034
2098	5,387	2,976	12	3,937	2,328	14,641

TABLE P-2 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	680,970	257,050	16,707	237,506	137,986	1,330,219

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

TABLE P-3
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	140	0	0	0	0	140
2041	239	0	0	0	0	239
2042	239	0	0	0	0	239
2043	621	0	0	0	0	621
2044	895	0	0	0	0	895
2045	5,598	4,313	0	0	0	9,911
2046	2,358	6,926	0	10,550	1,152	20,986
2047	15,789	5,079	282	10,554	1,777	33,482
2048	110,812	19,722	3,713	9,907	19,002	163,157
2049	79,658	43,496	2,643	51,292	15,080	192,169
2050	78,476	39,723	2,553	46,807	13,619	181,179
2051	74,488	26,576	2,087	23,546	6,042	132,738
2052	73,083	21,828	2,092	23,611	6,058	126,673
2053	71,874	22,784	1,988	23,361	5,971	125,978
2054	54,740	11,322	767	8,236	2,919	77,985
2055	34,682	17,114	318	5	1,445	53,564
2056	19,281	16,693	279	0	1,449	37,701
2057	2,696	907	8	0	819	4,430
2058	2,152	441	0	0	775	3,368
2059	2,152	441	0	0	775	3,368
2060	2,152	441	0	0	775	3,368
2061	2,152	441	0	0	775	3,368
2062	2,152	441	0	0	775	3,368
2063	2,136	392	0	0	775	3,303
2064	2,136	392	0	0	775	3,303
2065	2,136	392	0	0	775	3,303
2066	2,152	441	0	0	775	3,368
2067	2,152	441	0	0	775	3,368
2068	2,152	441	0	0	775	3,368
2069	2,104	294	0	0	775	3,172

TABLE P-3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	2,152	441	0	0	775	3,368
2071	2,120	343	0	0	775	3,238
2072	2,104	294	0	0	775	3,172
2073	2,087	245	0	0	775	3,107
2074	2,104	294	0	0	775	3,172
2075	2,087	245	0	0	775	3,107
2076	2,104	294	0	0	775	3,172
2077	2,087	245	0	0	775	3,107
2078	2,104	294	0	0	775	3,172
2079	2,104	294	0	0	775	3,172
2080	2,104	294	0	0	775	3,172
2081	2,104	294	0	0	775	3,172
2082	2,087	245	0	0	775	3,107
2083	2,087	245	0	0	775	3,107
2084	2,087	245	0	0	775	3,107
2085	2,104	294	0	0	775	3,172
2086	2,104	294	0	0	775	3,172
2087	2,104	294	0	0	775	3,172
2088	2,104	294	0	0	775	3,172
2089	2,104	294	0	0	775	3,172
2090	2,104	294	0	0	775	3,172
2091	2,087	245	0	0	775	3,107
2092	2,087	245	0	0	775	3,107
2093	2,087	245	0	0	775	3,107
2094	2,104	294	0	0	775	3,172
2095	2,104	294	0	0	775	3,172
2096	2,120	343	0	0	775	3,238
2097	2,120	1,978	0	0	24,994	29,092
2098	5,387	2,976	12	3,937	2,328	14,641

TABLE P-3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 25% CONTINGENCY
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	715,636	254,172	16,743	211,807	132,884	1,331,242

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

APPENDIX Q

SCHEDULE OF ANNUAL EXPENDITURES - CONSOLIDATED
10% CONTINGENCY*

* Calculated with 10% contingency as required to comply with the Public Utility Commission of Texas' Substantive Rule §25.231(b)(1)(F)(i)

TABLE Q-1
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	127	0	0	0	0	127
2041	216	0	0	0	0	216
2042	216	0	0	0	0	216
2043	562	0	0	0	0	562
2044	811	0	0	0	0	811
2045	69,201	5,237	1,477	25	3,687	79,627
2046	91,598	22,031	3,772	16,672	23,711	157,783
2047	69,450	39,181	2,394	51,921	14,907	177,852
2048	67,131	33,935	2,320	40,041	12,682	156,108
2049	53,937	16,504	1,890	24,021	6,172	102,524
2050	54,080	16,933	1,890	24,021	6,172	103,097
2051	41,551	22,479	1,265	18,869	5,612	89,777
2052	7,534	6,361	0	7	1,936	15,837
2053	8,557	7,226	0	7	1,930	17,721
2054	33,601	5,040	313	22	1,731	40,707
2055	30,888	15,324	288	4	1,368	47,871
2056	17,439	15,011	253	0	1,331	34,033
2057	2,381	807	8	0	745	3,941
2058	1,888	387	0	0	705	2,980
2059	1,888	387	0	0	705	2,980
2060	1,888	387	0	0	705	2,980
2061	1,888	387	0	0	705	2,980
2062	1,888	387	0	0	705	2,980
2063	1,874	344	0	0	705	2,923
2064	1,874	344	0	0	705	2,923
2065	1,874	344	0	0	705	2,923
2066	1,888	387	0	0	705	2,980
2067	1,888	387	0	0	705	2,980
2068	1,888	387	0	0	705	2,980
2069	1,845	258	0	0	705	2,808

TABLE Q-1 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	1,888	387	0	0	705	2,980
2071	1,860	301	0	0	705	2,865
2072	1,845	258	0	0	705	2,808
2073	1,831	215	0	0	705	2,751
2074	1,845	258	0	0	705	2,808
2075	1,831	215	0	0	705	2,751
2076	1,845	258	0	0	705	2,808
2077	1,831	215	0	0	705	2,751
2078	1,845	258	0	0	705	2,808
2079	1,845	258	0	0	705	2,808
2080	1,845	258	0	0	705	2,808
2081	1,845	258	0	0	705	2,808
2082	1,831	215	0	0	705	2,751
2083	1,831	215	0	0	705	2,751
2084	1,831	215	0	0	705	2,751
2085	1,845	258	0	0	705	2,808
2086	1,845	258	0	0	705	2,808
2087	1,845	258	0	0	705	2,808
2088	1,845	258	0	0	705	2,808
2089	1,845	258	0	0	705	2,808
2090	1,845	258	0	0	705	2,808
2091	1,831	215	0	0	705	2,751
2092	1,831	215	0	0	705	2,751
2093	1,831	215	0	0	705	2,751
2094	1,845	258	0	0	705	2,808
2095	1,845	258	0	0	705	2,808
2096	1,860	301	0	0	705	2,865
2097	1,860	1,703	0	0	22,637	26,199
2098	4,572	2,546	10	3,228	1,963	12,319

TABLE Q-1 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 1 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	628,049	221,486	15,879	178,837	134,087	1,178,337

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

TABLE Q-2
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	127	0	0	0	0	127
2041	216	0	0	0	0	216
2042	216	0	0	0	0	216
2043	562	0	0	0	0	562
2044	810	0	0	0	0	810
2045	4,943	3,801	0	0	0	8,744
2046	87,683	8,822	1,800	9,313	5,777	113,394
2047	68,696	38,314	3,216	50,094	22,768	183,088
2048	72,195	38,721	2,397	54,515	14,515	182,345
2049	56,839	20,666	2,013	28,678	7,759	115,954
2050	51,967	15,194	1,888	20,146	5,528	94,723
2051	54,587	23,056	1,888	20,146	5,528	105,205
2052	34,637	16,281	1,072	15,209	4,839	72,037
2053	8,552	7,226	0	7	1,777	17,562
2054	33,570	5,037	313	22	1,510	40,452
2055	30,829	15,311	288	4	1,329	47,762
2056	17,378	14,997	252	0	1,330	33,957
2057	2,380	806	8	0	745	3,939
2058	1,888	387	0	0	705	2,980
2059	1,888	387	0	0	705	2,980
2060	1,888	387	0	0	705	2,980
2061	1,888	387	0	0	705	2,980
2062	1,888	387	0	0	705	2,980
2063	1,874	344	0	0	705	2,923
2064	1,874	344	0	0	705	2,923
2065	1,874	344	0	0	705	2,923
2066	1,888	387	0	0	705	2,980
2067	1,888	387	0	0	705	2,980
2068	1,888	387	0	0	705	2,980
2069	1,845	258	0	0	705	2,808

TABLE Q-2 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	1,888	387	0	0	705	2,980
2071	1,860	301	0	0	705	2,865
2072	1,845	258	0	0	705	2,808
2073	1,831	215	0	0	705	2,751
2074	1,845	258	0	0	705	2,808
2075	1,831	215	0	0	705	2,751
2076	1,845	258	0	0	705	2,808
2077	1,831	215	0	0	705	2,751
2078	1,845	258	0	0	705	2,808
2079	1,845	258	0	0	705	2,808
2080	1,845	258	0	0	705	2,808
2081	1,845	258	0	0	705	2,808
2082	1,831	215	0	0	705	2,751
2083	1,831	215	0	0	705	2,751
2084	1,831	215	0	0	705	2,751
2085	1,845	258	0	0	705	2,808
2086	1,845	258	0	0	705	2,808
2087	1,845	258	0	0	705	2,808
2088	1,845	258	0	0	705	2,808
2089	1,845	258	0	0	705	2,808
2090	1,845	258	0	0	705	2,808
2091	1,831	215	0	0	705	2,751
2092	1,831	215	0	0	705	2,751
2093	1,831	215	0	0	705	2,751
2094	1,845	258	0	0	705	2,808
2095	1,845	258	0	0	705	2,808
2096	1,860	301	0	0	705	2,865
2097	1,860	1,700	0	0	22,613	26,173
2098	4,572	2,546	10	3,228	1,963	12,319

TABLE Q-2 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 2 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	604,955	223,647	15,145	201,362	125,484	1,170,593

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

TABLE Q-3
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2040	127	0	0	0	0	127
2041	216	0	0	0	0	216
2042	216	0	0	0	0	216
2043	562	0	0	0	0	562
2044	810	0	0	0	0	810
2045	4,943	3,801	0	0	0	8,744
2046	2,140	6,283	0	8,993	1,040	18,457
2047	14,319	4,659	255	8,997	1,621	29,851
2048	99,912	17,007	3,362	8,371	17,324	145,977
2049	70,086	36,733	2,393	42,759	13,623	165,594
2050	69,194	33,639	2,312	39,111	12,316	156,571
2051	66,449	23,222	1,889	20,188	5,535	117,284
2052	65,219	19,054	1,895	20,243	5,550	111,960
2053	64,148	19,884	1,800	20,030	5,468	111,329
2054	48,123	9,822	694	7,061	2,682	68,383
2055	30,867	15,379	288	4	1,331	47,869
2056	17,415	15,076	253	0	1,331	34,075
2057	2,381	809	8	0	745	3,942
2058	1,888	387	0	0	705	2,980
2059	1,888	387	0	0	705	2,980
2060	1,888	387	0	0	705	2,980
2061	1,888	387	0	0	705	2,980
2062	1,888	387	0	0	705	2,980
2063	1,874	344	0	0	705	2,923
2064	1,874	344	0	0	705	2,923
2065	1,874	344	0	0	705	2,923
2066	1,888	387	0	0	705	2,980
2067	1,888	387	0	0	705	2,980
2068	1,888	387	0	0	705	2,980
2069	1,845	258	0	0	705	2,808

TABLE Q-3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2070	1,888	387	0	0	705	2,980
2071	1,860	301	0	0	705	2,865
2072	1,845	258	0	0	705	2,808
2073	1,831	215	0	0	705	2,751
2074	1,845	258	0	0	705	2,808
2075	1,831	215	0	0	705	2,751
2076	1,845	258	0	0	705	2,808
2077	1,831	215	0	0	705	2,751
2078	1,845	258	0	0	705	2,808
2079	1,845	258	0	0	705	2,808
2080	1,845	258	0	0	705	2,808
2081	1,845	258	0	0	705	2,808
2082	1,831	215	0	0	705	2,751
2083	1,831	215	0	0	705	2,751
2084	1,831	215	0	0	705	2,751
2085	1,845	258	0	0	705	2,808
2086	1,845	258	0	0	705	2,808
2087	1,845	258	0	0	705	2,808
2088	1,845	258	0	0	705	2,808
2089	1,845	258	0	0	705	2,808
2090	1,845	258	0	0	705	2,808
2091	1,831	215	0	0	705	2,751
2092	1,831	215	0	0	705	2,751
2093	1,831	215	0	0	705	2,751
2094	1,845	258	0	0	705	2,808
2095	1,845	258	0	0	705	2,808
2096	1,860	301	0	0	705	2,865
2097	1,860	1,703	0	0	22,634	26,196
2098	4,572	2,546	10	3,228	1,963	12,319

TABLE Q-3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES - 10% CONTINGENCY
UNIT 3 - CONSOLIDATED (INCLUDES SITE FACILITIES)
(Thousands of 2023 Dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
Total	635,897	220,787	15,159	178,986	120,664	1,171,493

Note: One third of the decommissioning cost of each of the Site Facilities (Stored Steam Generators and Storage Facility, Water Reclamation Facility, Water Reclamation Supply System Pipeline & Structures, Evaporation Ponds, Make-up Water Reservoir, Stored Reactor Closure Heads & Storage Facility, and ISFSI) has been allocated to each unit's cash flow.

DOCKET NO. 57568

APPLICATION OF EL PASO ELECTRIC COMPANY TO CHANGE RATES	§ § §	PUBLIC UTILITY COMMISSION OF TEXAS

DIRECT TESTIMONY

OF

JOHN J. SPANOS

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

FOR

EL PASO ELECTRIC COMPANY

JANUARY 2025

EXECUTIVE SUMMARY

John J. Spanos, President of Gannett Fleming Valuation and Rate Consultants, LLC, supports depreciation rates for electric assets included in the Company's depreciation study in this rate case. Mr. Spanos summarizes the proposed depreciation rates for all assets, compares those rates to the Company's current rates, and explains some of the major factors that caused the change in depreciation rates.

Mr. Spanos also testifies that he used the straight-line remaining life method of depreciation with the average service life procedure in performing his analysis. His testimony details the processes by which he determined service lives, net salvage percentages, and estimated annual depreciation accrual rates.

TABLE OF CONTENTS

EXHIBITS

I. Introduction and Purpose

Q1. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is John J. Spanos. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania.

Q2. ARE YOU ASSOCIATED WITH ANY FIRM?

A. Yes. I am associated with the firm of Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming").

Q3. HOW LONG HAVE YOU BEEN ASSOCIATED WITH GANNETT FLEMING?

A. I have been associated with the firm since June 1986.

Q4. WHAT IS YOUR POSITION WITH THE FIRM?

A. I am President.

Q5. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?

A. I am testifying on behalf of El Paso Electric Company ("EPE" or the "Company").

Q6. PLEASE STATE YOUR QUALIFICATIONS.

A. I have over 38 years of depreciation experience which includes giving expert testimony in more than 480 cases before 46 regulatory commissions, including the Public Utility Commission of Texas ("PUCT" or "Commission"). These cases have included depreciation studies in the electric, gas, water, wastewater, and pipeline industries. In addition to cases where I have submitted testimony, I have also supervised over 900 other depreciation or valuation assignments. Please refer to Exhibit JJS-1 for my qualifications statement, which includes further information with respect to my work history, case experience, and leadership in the Society of Depreciation Professionals.

Q7. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I sponsor the depreciation study performed for EPE ("Depreciation Study") included in the Rate Filing Package, which is attached to my testimony as Exhibit JJS-2. The

Depreciation Study sets forth the calculated annual depreciation accrual rates by account as of June 30, 2024. The proposed rates appropriately reflect the rates at which EPE's assets should be depreciated over their useful lives and are based on the most commonly used methods and procedures for determining depreciation rates.

Q8. WHAT SCHEDULES ARE YOU SPONSORING?

A. I co-sponsor the portion of Schedule D-5 that presents the depreciation rates developed for EPE ("Depreciation Calculations") for these assets as of June 30, 2024. The proposed rates are set forth in Exhibit JJS-2 and appropriately reflect the rates at which EPE assets in these calculations should be depreciated over their useful lives. I also co-sponsor Schedule D-8 that presents the average service life of EPE's assets as of June 30, 2024.

Q9. WERE THE SCHEDULES AND EXHIBITS YOU ARE SPONSORING OR CO-SPONSORING PREPARED BY YOU OR UNDER YOUR DIRECT SUPERVISION?

A. Yes, they were.

Q10. CAN YOU SUMMARIZE THE DEPRECIATION RATES BASED ON EXHIBIT JJS-2 AND COMPARE THE CURRENT RATES TO THE PROPOSED RATES?

A. Yes. The table below sets forth a comparison of the currently utilized depreciation rates by function and resulting expense to the proposed depreciation rates and expense for EPE plant in service as of June 30, 2024. As discussed in detail below, EPE is requesting approval of the depreciation rates set forth in the Appendix of Exhibit JJS-2, which do not include interim survivor curves for generating assets. Accordingly, the proposed depreciation rates column in Table JJS-1 below reflects the Appendix rates.

TABLE JJS-1

	Current		Proposed	
Function	Rate	Proforma Expense	Rate	Expense
Steam	3.48	$26,211,791	4.64	$34,964,852
Gas Turbine	2.52	20,696,778	2.78	22,885,253
Transmission	1.59	11,535,506	1.68	12,159,013
Distribution	2.07	38,296,156	2.40	44,280,088
General	5.46	15,366,675	3.53	9,931,519
Total	2.53	$112,106,907	2.81	$124,220,725

Q11. CAN YOU EXPLAIN SOME OF THE FACTORS THAT CAUSED CHANGES IN THE RATES SET FORTH IN THE APPENDIX TO EXHIBIT JJS-2 FROM THE DEPRECIATION RATES CURRENTLY UTILIZED?

A. Yes. The major components that caused rates to change by function are as follows:

- Steam Production Plant: The utilization of updated probable retirement dates for some generating facilities and the capital additions in Accounts 313 and 314 for some of the older facilities.
- Gas Turbine Plant: The utilization of the proper weighted net salvage component and the capital additions for most facilities, including the addition of Newman Unit 6.
- Transmission Plant: The generally longer average service lives for most accounts except Account 353, Station Equipment.
- Distribution Plant: The shorter average service lives for Account 362 and more negative net salvage percentage for some accounts.
- General Plant: The segregation and proper determination of life characteristics of the transportation equipment assets.

II. Depreciation Calculations

Q12. PLEASE DEFINE THE CONCEPT OF DEPRECIATION.

A. Depreciation refers to the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in

the course of service from causes which are known to be current operations against which the Company is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and the requirements of public authorities.

Q13. DID YOU PREPARE THE DEPRECIATION STUDY FILED BY EPE IN THIS PROCEEDING?

A. Yes. I prepared the Depreciation Study presented in rate filing package Schedule D-5 and a summary of the proposed depreciation rates in Exhibit JJS-2 that are submitted by EPE with its filing in this proceeding. The schedule and exhibit set forth the results of my Depreciation Study as of June 30, 2024.

Q14. PLEASE DESCRIBE THE CONTENTS OF YOUR DEPRECIATION STUDY.

A. My report is presented in nine parts. Part I, Introduction, presents the scope and basis for the Depreciation Study. Part II, Estimation of Survivor Curves, includes descriptions of the methodology of estimating survivor curves. Parts III and IV set forth the analysis for determining life and net salvage estimation. Part V, Calculation of Annual and Accrued Depreciation, includes the concepts of depreciation and amortization using the remaining life. Part VI, Results of Study, presents a description of the results and a summary of the depreciation calculations. Parts VII, VIII, and IX include graphs and tables that relate to the service life and net salvage analyses and the detailed depreciation calculations.

The table on pages VI-5 through VI-9 presents the estimated survivor curve; the net salvage percent; the original cost as of June 30, 2024; the book depreciation reserve; and the calculated annual depreciation accrual and rate for each account or subaccount. The section beginning on page VII-2 presents the results of the retirement rate analyses prepared as the historical bases for the service life estimates. The section beginning on page VIII-2 presents the results of the salvage analysis. The section beginning on page IX-2 presents the depreciation calculations related to surviving original cost as of June 30, 2024. Also, there is an Appendix at the end of the Depreciation Study that sets forth depreciation rates utilizing no interim survivor curve for the major generating facilities.

Q15. PLEASE EXPLAIN HOW YOU PERFORMED YOUR DEPRECIATION STUDY.

A. I used the straight-line remaining life method of depreciation, with the average service life procedure. The annual depreciation is based on a method of depreciation accounting that seeks to distribute the unrecovered cost of fixed capital assets over the estimated remaining useful life of each unit, or group of assets, in a systematic and rational manner.

For General Plant Accounts 391, 393, 394, 395, 397, and 398[1], I used the straight-line remaining life method of amortization. The account numbers identified throughout my testimony represent those in effect as of June 30, 2024. The annual amortization is based on amortization accounting that distributes the unrecovered cost of fixed capital assets over the remaining amortization period selected for each account and vintage.

Q16. HOW DID YOU DETERMINE THE ANNUAL DEPRECIATION ACCRUAL RATES?

A. I did this in two phases. In the first phase, I estimated the service life and net salvage characteristics for each depreciable group, that is, each plant account or subaccount identified as having similar characteristics. In the second phase, I calculated the composite remaining lives and annual depreciation accrual rates based on the service life and net salvage estimates determined in the first phase.

Q17. PLEASE DESCRIBE THE FIRST PHASE OF THE DEPRECIATION STUDY IN WHICH YOU ESTIMATED THE SERVICE LIFE AND NET SALVAGE CHARACTERISTICS FOR EACH DEPRECIABLE GROUP.

A. The service life and net salvage studies consisted of compiling historical data from records related to EPE's plant; analyzing these data to obtain historical trends of survivor characteristics; obtaining supplementary information from management and operating personnel concerning practices and plans as they relate to plant operations; and interpreting the above data and the estimates used by other electric utilities to form judgments of average service life and net salvage characteristics.

1 391, Office Furniture and Equipment; 393, Stores Equipment; 394, Tools, Shop and Garage Equipment; 395, Laboratory Equipment; 397, Communication Equipment; 398, Miscellaneous Equipment.

Q18. WHAT HISTORICAL DATA DID YOU ANALYZE FOR THE PURPOSE OF ESTIMATING SERVICE LIFE CHARACTERISTICS?

A. I analyzed the Company's accounting entries that record plant transactions during the period 1993 through 2023. The transactions included additions, retirements, transfers, sales, and the related balances.

Q19. WHAT METHOD DID YOU USE TO ANALYZE THIS SERVICE LIFE DATA?

A. I used the retirement rate method. This is the most appropriate method when retirement data covering a long period of time is available because this method determines the average rates of retirement actually experienced by the Company during the period of time covered by the Depreciation Study.

Q20. PLEASE DESCRIBE HOW YOU USED THE RETIREMENT RATE METHOD TO ANALYZE EPE'S SERVICE LIFE DATA.

A. I applied the retirement rate analysis to each different group of property in the study. For each property group, I used the retirement rate data to form a life table that, when plotted, shows an original survivor curve for that property group. Each original survivor curve represents the average survivor pattern experienced by the several vintage groups during the experience band studied. The survivor patterns do not necessarily describe the life characteristics of the property group; therefore, interpretation of the original survivor curves is required in order to use them as valid considerations in estimating service life. The Iowa-type survivor curves were used to perform these interpretations.

Q21. WHAT IS AN "IOWA-TYPE SURVIVOR CURVE" AND HOW DID YOU USE SUCH CURVES TO ESTIMATE THE SERVICE LIFE CHARACTERISTICS FOR EACH PROPERTY GROUP?

A. Iowa-type curves are a widely used group of survivor curves that contain the range of survivor characteristics usually experienced by utilities and other industrial companies. The Iowa curves were developed at the Iowa State College Engineering Experiment Station through an extensive process of observing and classifying the ages at which various types of property used by utilities and other industrial companies had been retired.

Iowa-type curves are used to smooth and extrapolate original survivor curves determined by the retirement rate method. The Iowa curves and truncated Iowa curves were used in this study to describe the forecasted rates of retirement based on the observed rates of retirement and the outlook for future retirements.

The estimated survivor curve designations for each depreciable property group indicate the average service life, the family within the Iowa system to which the property group belongs, and the relative height of the mode. For example, the Iowa 65-R2.5 indicates an average service life of sixty-five years; a right-moded, or R, type curve (the mode occurs after average life for right-moded curves); and a moderate height, 2.5, for the mode (possible modes for R type curves range from 1 to 5).

Q22. WHAT APPROACH DID YOU USE TO ESTIMATE THE LIVES OF SIGNIFICANT FACILITIES SUCH AS PRODUCTION PLANTS?

A. I used the life span technique to estimate the lives of significant facilities for which concurrent retirement of the entire facility is anticipated. In this technique, the survivor characteristics of such facilities are described by the use of interim survivor curves and estimated probable retirement dates.

The interim survivor curves describe the rate of retirement related to the replacement of elements of the facility, such as, for a building, the retirements of plumbing, heating, doors, windows, roofs, etc., that occur during the life of the facility. The probable retirement date provides the rate of final retirement for each year of installation for the facility by truncating the interim survivor curve for each installation year at its attained age at the date of probable retirement. The use of interim survivor curves truncated at the date of probable retirement provides a consistent method for estimating the lives of the several years of installation for a particular facility inasmuch as a single concurrent retirement for all years of installation will occur when it is retired.

Q23. HAS GANNETT FLEMING USED THIS APPROACH IN OTHER PROCEEDINGS?

A. Yes, we have used the life span technique in performing depreciation studies presented to and accepted by many public utility commissions across the United States and Canada, including this Commission. This technique is currently being utilized by EPE in the same

manner in this case as in the 2015 Rate Case (DN 44941) and for the updated calculated rates in the 2017 and 2021 Rate Cases (DN 46831 and DN 52195, respectively) which were approved by this Commission.

Q24. WHAT ARE THE BASES FOR THE PROBABLE RETIREMENT YEARS THAT YOU HAVE ESTIMATED FOR EACH FACILITY?

A. The probable retirement years are life spans for each facility that are based on informed judgment and incorporate consideration of the age, use, size, nature of construction, management outlook, and typical life spans experienced and used by other electric utilities for similar facilities. Most of the life spans result in probable retirement years that are many years in the future. As a result, the retirement of these facilities is not yet subject to specific management plans. Such plans would be premature. At the appropriate time, detailed studies of the economics of rehabilitation and continued use or retirement of the structure will be performed, and the results incorporated in the estimation of the facility's life span.

Q25. WHAT IS LIFE SPAN PROPERTY?

A. Life span property is a term used to describe property for which all assets at a facility will be retired concurrently. Power plants and large buildings are textbook examples of life span property. When a power plant reaches the end of its useful life, all assets at the plant will be retired. The period of time from the original installation of the facility to the time it is retired from service is the life span of the facility.

Q26. WILL ALL ASSETS AT A LIFE SPAN FACILITY BE IN SERVICE FOR THE ENTIRE LIFE SPAN OF THE FACILITY?

A. No. Many assets will be retired prior to the end of the facility. For power plants, assets such as pumps, piping, and boiler tubes must be replaced throughout the life of the facility in order for the plant to continue to operate and reach the end of its life span. Similarly, for buildings assets such as HVAC equipment and the roof will be replaced during the life of the building.

Q27. BECAUSE MANY ASSETS WILL BE RETIRED PRIOR TO THE END OF THE LIFE SPAN OF THE FACILITY, SHOULD THE COSTS OF THESE ASSETS BE RECOVERED OVER THEIR SERVICE LIVES?

A. Yes. Depreciation principles require that the cost of an asset be allocated over its service life, as opposed to being recovered after the asset is retired. Interim retirements should therefore be depreciated over their service lives and should not be recovered after they are retired.

Q28. DOES COMMISSION PRECEDENT RECOGNIZE THIS PRINCIPLE?

A. No. It is my understanding that the Commission's precedent excludes interim retirements and therefore does not depreciate these assets over their service life. It instead requires that these assets be depreciated over a longer period of time, despite the fact that interim retirements can be estimated using widely accepted techniques. As I explain below, this treatment is not consistent with the prevailing authorities on this subject or the requirements of the FERC Uniform System of Accounts.

Q29. IS THE COMPANY'S REQUEST IN THIS CASE CONSISTENT WITH COMMISSION PRECEDENT AND THE COMPANY'S AGREEMENT IN THE LAST RATE CASE?

A. Yes.

Q30. WHY HAVE EPE'S CURRENT DEPRECIATION RATES BEEN SETTLED WITHOUT INTERIM RATES OF RETIREMENT?

A. The depreciation rates agreed upon to settle the Company's last rate case were part of a larger settlement and should have no precedential effect. The only justification against the inclusion of interim retirements is prior Commission precedent regarding interim retirements from over 30 years ago. This precedent contradicts depreciation authorities, the FERC Uniform System of Accounts, and the practices of every other jurisdiction in the country.

In a past case, Docket No. 40443, the primary reason cited by the Administrative Law Judges ("ALJs") for excluding interim retirements was previous Commission precedent. The ALJs cited an order from 1990, in Docket Nos. 8425 and 8431, and state

that "[t]he Commission has previously explained that interim retirements are not known and measurable and should be incorporated in the depreciation calculation when those retirements are actually made."[2]

Q31. DO YOU HAVE ANY CONCERNS ABOUT THIS APPROACH?

A. Yes, as I explain herein, this is contrary to the clear and well-accepted, authoritative guidance on this issue. Interim retirements must be included in order to be consistent with authoritative depreciation tests as well as the FERC Uniform System of Accounts.

Q32. DO AUTHORITATIVE DEPRECIATION TEXTS SUPPORT THAT INTERIM RETIREMENTS SHOULD BE INCLUDED IN DEPRECIATION?

A. Yes. The National Association of Regulatory Utility Commissioner's publication *Public Utility Depreciation Practices* (the "NARUC Manual") is a well-regarded, authoritative depreciation text. The NARUC Manual discusses the life span method and explains (emphasis added):

> Property studied using the life span method will usually have additions after the initial placement of the property and retirements prior to the final date of retirement of the property. Some interim additions may remain in service to the final retirement date, whereas others may be retired prior to this date. For example, a building may have a structural addition that will remain until the entire building is retired, whereas an addition such as a roof, plumbing, or internal partitions may be retired prior to the final building retirement. Appropriate estimates must be made for such interim retirements; however, interim additions are not considered in the depreciation base or rate until they occur.[3]

The NARUC Manual uses mandatory language stating that estimates for interim retirements must be included in depreciation.

Frank Wolf and Chester Fitch's publication *Depreciation Systems*, another highly regarded depreciation text, also explains that interim retirements are included in depreciation for life span property:

2 *Application of Southwestern Electric Power Company for Authority to Change Rates & Reconcile Fuel Costs*, Docket No. 40443, Proposal for Decision at 191 (May 20, 2013).

3 National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices* at 142 (1996).

> The term *interim retirements* are used to describe those retirements that take place before the final retirement of all property. These retirements typically can be analyzed by standard methods to derive an interim survivor curve. The surviving property follows that curve until the end of the life span, when it drops to zero percent surviving. The resulting survivor curve for each vintage can be described as a truncated survivor curve. The average life of a vintage will be forecast by estimating the pattern of interim survivors, estimating the date of final retirement, and calculating the area under the truncated survivor curve.[4]

Q33. DOES THE FERC UNIFORM SYSTEM OF ACCOUNTS REQUIRE THAT INTERIM RETIREMENTS BE INCLUDED IN DEPRECIATION?

A. Yes. The FERC Uniform System of Accounts requires that the service value of an asset (original cost less net salvage) be allocated over the asset's service life. Since interim retirements will occur, the Uniform System of Accounts therefore requires that estimates of interim retirements be included in depreciation rates.

Specifically, Plant Instruction 22.A of the Uniform System of Accounts states (emphasis added):

> *Method.* Utilities must use a method of depreciation that allocates in a systematic and rational manner the service value of depreciable property over the service life of the property.

Service life is defined in Definition 36 of the Uniform System of Accounts:

> *Service life* means the time between the date electric plant is includible in electric plant in service, or electric plant leased to others, and the date of its retirement. If depreciation is accounted for on a production basis rather than on a time basis, then service life should be measured in terms of the appropriate unit of production.

The service life for interim retirements is the time between when the asset is placed in service and when it is retired. The FERC Uniform System of Accounts therefore requires that these assets be depreciated over this period of time—that is, that these assets be depreciated over a time shorter than the full life span of the facility.

Q34. WHAT CAN YOU CONCLUDE REGARDING INTERIM RETIREMENTS?

4 Frank Wolf and Chester Fitch, *Depreciation Systems* at 283 (1994).

A. Experience has shown that interim retirements can and will occur. Depreciation principles therefore require that estimates of interim retirements be incorporated into depreciation rates. While Commission precedent may disfavor including interim retirements, this precedent is outdated, is inconsistent with the FERC Uniform System of Accounts, is out of step with all other jurisdictions, produces intergeneration inequity, and should therefore be reconsidered. In order to produce the proper depreciation rates for production plant (and general plant structures) that are consistent with the FERC Uniform System of Accounts and authoritative depreciation texts, interim retirements must be included in depreciation rates.

Q35. DID YOU PHYSICALLY OBSERVE EPE'S PLANT AND EQUIPMENT AS PART OF YOUR DEPRECIATION STUDY?

A. Yes. My most recent field review of the Company's property as part of this study was made in October 2024 to observe representative portions of plant. Previous field reviews have been taken in February 2020, August 2014, February 2009, and February 2003. Field reviews are conducted to become familiar with company operations and to obtain an understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements. This knowledge, as well as information from other discussions with management, was incorporated in the interpretation and extrapolation of the statistical analyses.

Q36. WOULD YOU EXPLAIN THE CONCEPT OF "NET SALVAGE"?

A. Net salvage is a component of the service value of capital assets that is reflected in depreciation rates. The service value of an asset is its original cost less its net salvage. Net salvage is the salvage value received for the asset upon retirement less the cost to retire the asset. When the cost to retire exceeds the salvage value, the result is negative net salvage.

Inasmuch as depreciation expense is the loss in service value of an asset during a defined period, e.g., one year, it must include a ratable portion of both the original cost and the net salvage. That is, the net salvage related to an asset should be incorporated in the cost of service during the same period as its original cost so that customers receiving service

from the asset pay rates that include a portion of both elements of the asset's service value: the original cost and the net salvage value.

For example, the full recovery of the service value of a $10,000 distribution pole includes not only the $10,000 of original cost, but also, on average, $3,200 to remove the pole at the end of its life and $200 in salvage value. In this example, the net salvage component is negative $3,000 (i.e., $200 - $3,200), and the net salvage percent is negative 30% (i.e., ($200 - $3,200)/$10,000).

Q37. PLEASE DESCRIBE HOW YOU ESTIMATED NET SALVAGE PERCENTAGES?

A. I estimated the net salvage percentages by reviewing the Company's account specific historical salvage and cost of removal data for the period 1993 through 2023 as a percentage of the associated retired plant as well as considering industry experience in terms of net salvage estimates for other electric companies.

Q38. HAVE YOU INCLUDED A DISMANTLEMENT COMPONENT INTO THE OVERALL RECOVERY OF GENERATING FACILITIES?

A. Yes. A dismantlement component has been included in the net salvage percentage for all the generation facilities. The dismantlement component for generating units has been approved in Texas for other facilities.

Q39. CAN YOU EXPLAIN HOW THE DISMANTLEMENT COMPONENT IS INCLUDED IN THE DEPRECIATION RATES SET FORTH IN EXHIBIT JJS-2?

A. Yes. The dismantlement component is part of the overall net salvage for each location/unit within the steam and gas turbine accounts. Based on studies for comparable facilities of other utilities, it was determined that the dismantlement or decommissioning costs for steam or other production facilities is best calculated by dividing the dismantlement cost by the surviving plant at final retirement. These location-based amounts are added to the interim net salvage percentage of the assets anticipated to be retired on an interim basis to produce the weighted net salvage percentage for each location. The detailed calculation for each location is set forth on page VIII-3 of Exhibit JJS-2.

Q40. PLEASE DESCRIBE THE SECOND PHASE OF THE PROCESS THAT YOU USED IN THE DEPRECIATION CALCULATIONS IN WHICH YOU CALCULATED COMPOSITE REMAINING LIVES AND ANNUAL DEPRECIATION ACCRUAL RATES.

A. After I estimated the service life and net salvage characteristics for each depreciable property group, I calculated the annual depreciation accrual rates for each group, using the straight-line remaining life method, and using remaining lives weighted consistent with the average service life procedure.

Q41. WHAT IS THE STRAIGHT-LINE REMAINING LIFE METHOD OF DEPRECIATION?

A. The straight-line remaining life method of depreciation allocates the original cost of the property, less accumulated depreciation, less future net salvage, in equal amounts to each year of remaining service life.

Q42. PLEASE DESCRIBE AMORTIZATION ACCOUNTING.

A. In amortization accounting, units of property are capitalized in the same manner as they are in depreciation accounting. Amortization accounting is used for accounts with a large number of units, but small asset values. Depreciation accounting is difficult for these assets because periodic inventories are required to properly reflect plant in service. Consequently, retirements are recorded when a vintage is fully amortized rather than as the units are removed from service. That is, there is no dispersion of retirements. All units are retired when the age of the vintage reaches the end of the amortization period. Each plant account or group of assets is assigned a fixed period which represents an anticipated life during which the asset will render full benefit. For example, in amortization accounting, assets that have a 15-year amortization period will be fully recovered after 15 years of service and taken off the Company's books, but not necessarily removed from service. In contrast, assets that are taken out of service before 15 years remain on the books until the amortization period for that vintage has expired.

Q43. FOR WHICH PLANT ACCOUNTS IS AMORTIZATION ACCOUNTING BEING UTILIZED?

A. Amortization accounting is only appropriate for certain General Plant accounts. These accounts are 391, 393, 394, 395, 397, and 398. These accounts represent less than 2% of the Company's depreciable plant.

Q44. PLEASE USE AN EXAMPLE TO ILLUSTRATE HOW THE ANNUAL DEPRECIATION ACCRUAL RATE FOR A PARTICULAR GROUP OF PROPERTY IS PRESENTED IN YOUR DEPRECIATION STUDY.

A. I will use Account 368, Line Transformers, as an example because it is one of the largest depreciable mass accounts and represents approximately eight percent of depreciable plant.

The retirement rate method was used to analyze the survivor characteristics of this property group. Aged plant accounting data was compiled from 1993 through 2023 and analyzed in periods that best represent the overall service life of this property. The life table for the 1993-2023 experience band is presented on pages VII-88 through VII-91 of the Depreciation Study. The life table displays the retirement and surviving ratios of the aged plant data exposed to retirement by age interval. For example, page VII-89 shows $117,542 retired at age 0.5 with $298,474,421 exposed to retirement. Consequently, the retirement ratio is 0.0004 and the surviving ratio is 0.9996. This life table, or original survivor curve, is plotted along with the estimated smooth survivor curve, the 51-R3, on page VII-88.

The net salvage percent is presented on pages VIII-43 and VIII-44. The percentage is based on the result of annual gross salvage minus the cost to remove plant assets as compared to the original cost of plant retired during the period 1993 through 2023. The 31-year period experienced $4,643,183 ($2,914,456 - $7,557,640) in net negative salvage for $20,613,350 plant retired. The result is negative net salvage of 23% ($4,643,183/$20.613,350) and the most recent five-year result is negative net salvage of 44%. Therefore, based on industry ranges, historical indications of these assets and Company expectations, I determined that negative 25% was the most appropriate estimate for this account.

My calculation of the annual depreciation related to the original cost as of June 30, 2024, of electric plant is presented on pages IX-93 through IX-95. The calculation is based on the 51-R3 survivor curve, 25% negative net salvage, the attained age, and the allocated book reserve. The tabulation sets forth the installation year, the original cost, calculated

accrued depreciation, allocated book reserve, future accruals, remaining life, and annual accrual. These totals are brought forward to the table on page VI-9.

Q45. ARE YOU RECOMMENDING APPROVAL OF THE DEPRECIATION RATES IN YOUR EXHIBIT JJS-2?

A. Yes, however, the new depreciation rates in the Appendix of Exhibit JJS-2 are the recommendation. EPE is requesting new depreciation rates for all assets as of June 30, 2024, which are based on the current practice in Texas which does not include interim survivor curves for generating plant subject to life spanning. EPE witness Cynthia S. Prieto sets forth the depreciation expense based on these depreciation rates.

Q46. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Exhibit JJS-1

JOHN SPANOS

DEPRECIATION EXPERIENCE

Q. Please state your name.

A. My name is John J. Spanos.

Q. What is your educational background?

A. I have Bachelor of Science degrees in Industrial Management and Mathematics from Carnegie-Mellon University and a Master of Business Administration from York College.

Q. Do you belong to any professional societies?

A. Yes. I am a member and past President of the Society of Depreciation Professionals and a member of the American Gas Association/Edison Electric Institute Industry Accounting Committee.

Q. Do you hold any special certification as a depreciation expert?

A. Yes. The Society of Depreciation Professionals has established national standards for depreciation professionals. The Society administers an examination to become certified in this field. I passed the certification exam in September 1997 and was recertified in August 2003, February 2008, January 2013, February 2018 and February 2023.

Q. Please outline your experience in the field of depreciation.

A. In June 1986, I was employed by Gannett Fleming Valuation and Rate Consultants, Inc. as a Depreciation Analyst. During the period from June 1986 through December 1995, I helped prepare numerous depreciation and original cost studies for utility companies in various industries. I helped perform depreciation studies for the following telephone companies: United Telephone of Pennsylvania, United Telephone of New Jersey, and Anchorage Telephone Utility. I helped perform depreciation studies for the following companies in

the railroad industry: Union Pacific Railroad, Burlington Northern Railroad, and Wisconsin Central Transportation Corporation.

I helped perform depreciation studies for the following organizations in the electric utility industry: Chugach Electric Association, The Cincinnati Gas and Electric Company (CG&E), The Union Light, Heat and Power Company (ULH&P), Northwest Territories Power Corporation, and the City of Calgary - Electric System.

I helped perform depreciation studies for the following pipeline companies: TransCanada Pipelines Limited, Trans Mountain Pipe Line Company Ltd., Interprovincial Pipe Line Inc., Nova Gas Transmission Limited and Lakehead Pipeline Company.

I helped perform depreciation studies for the following gas utility companies: Columbia Gas of Pennsylvania, Columbia Gas of Maryland, The Peoples Natural Gas Company, T. W. Phillips Gas & Oil Company, CG&E, ULH&P, Lawrenceburg Gas Company and Penn Fuel Gas, Inc.

I helped perform depreciation studies for the following water utility companies: Indiana-American Water Company, Consumers Pennsylvania Water Company and The York Water Company; and depreciation and original cost studies for Philadelphia Suburban Water Company and Pennsylvania-American Water Company.

In each of the above studies, I assembled and analyzed historical and simulated data, performed field reviews, developed preliminary estimates of service life and net salvage, calculated annual depreciation, and prepared reports for submission to state public utility commissions or federal regulatory agencies. I performed these studies under the general direction of William M. Stout, P.E.

In January 1996, I was assigned to the position of Supervisor of Depreciation Studies. In July 1999, I was promoted to the position of Manager, Depreciation and

Valuation Studies. In December 2000, I was promoted to the position as Vice-President of Gannett Fleming Valuation and Rate Consultants, Inc., in April 2012, I was promoted to the position as Senior Vice President of the Valuation and Rate Division of Gannett Fleming Inc. (now doing business as Gannett Fleming Valuation and Rate Consultants, LLC) and in January of 2019, I was promoted to my present position of President of Gannett Fleming Valuation and Rate Consultants, LLC. In my current position I am responsible for conducting all depreciation, valuation and original cost studies, including the preparation of final exhibits and responses to data requests for submission to the appropriate regulatory bodies.

Since January 1996, I have conducted depreciation studies similar to those previously listed including assignments for Pennsylvania-American Water Company; Aqua Pennsylvania; Kentucky-American Water Company; Virginia-American Water Company; Indiana-American Water Company; Iowa-American Water Company; New Jersey-American Water Company; Hampton Water Works Company; Omaha Public Power District; Enbridge Pipe Line Company; Inc.; Columbia Gas of Virginia, Inc.; Virginia Natural Gas Company National Fuel Gas Distribution Corporation - New York and Pennsylvania Divisions; The City of Bethlehem - Bureau of Water; The City of Coatesville Authority; The City of Lancaster - Bureau of Water; Peoples Energy Corporation; The York Water Company; Public Service Company of Colorado; Enbridge Pipelines; Enbridge Gas Distribution, Inc.; Reliant Energy-HLP; Massachusetts-American Water Company; St. Louis County Water Company; Missouri-American Water Company; Chugach Electric Association; Alliant Energy; Oklahoma Gas & Electric Company; Nevada Power Company; Dominion Virginia Power; NUI-Virginia Gas Companies; Pacific Gas & Electric Company; PSI Energy; NUI - Elizabethtown Gas Company; Cinergy Corporation – CG&E; Cinergy

Corporation – ULH&P; Columbia Gas of Kentucky; South Carolina Electric & Gas Company; Idaho Power Company; El Paso Electric Company; Aqua North Carolina; Aqua Ohio; Aqua Texas, Inc.; Aqua Illinois, Inc.; Ameren Missouri; Central Hudson Gas & Electric; Centennial Pipeline Company; CenterPoint Energy-Arkansas; CenterPoint Energy – Oklahoma; CenterPoint Energy – Entex; CenterPoint Energy - Louisiana; NSTAR – Boston Edison Company; Westar Energy, Inc.; United Water Pennsylvania; PPL Electric Utilities; PPL Gas Utilities; Wisconsin Power & Light Company; TransAlaska Pipeline; Avista Corporation; Northwest Natural Gas; Allegheny Energy Supply, Inc.; Public Service Company of North Carolina; South Jersey Gas Company; Duquesne Light Company; MidAmerican Energy Company; Laclede Gas; Duke Energy Company; E.ON U.S. Services Inc.; Elkton Gas Services; Anchorage Water and Wastewater Utility; Kansas City Power and Light; Duke Energy North Carolina; Duke Energy South Carolina; Monongahela Power Company; Potomac Edison Company; Duke Energy Ohio Gas; Duke Energy Kentucky; Duke Energy Indiana; Duke Energy Progress; Northern Indiana Public Service Company; Tennessee- American Water Company; Columbia Gas of Maryland; Maryland-American Water Company; Bonneville Power Administration; NSTAR Electric and Gas Company; EPCOR Distribution, Inc.; B. C. Gas Utility, Ltd; Entergy Arkansas; Entergy Texas; Entergy Mississippi; Entergy Louisiana; Entergy Gulf States Louisiana; the Borough of Hanover; Louisville Gas and Electric Company; Kentucky Utilities Company; Madison Gas and Electric; Central Maine Power; PEPCO; PacifiCorp; Minnesota Energy Resource Group; Jersey Central Power & Light Company; Cheyenne Light, Fuel and Power Company; United Water Arkansas; Central Vermont Public Service Corporation; Green Mountain Power; Portland General Electric Company; Atlantic City Electric; Nicor Gas Company; Black Hills Power; Black Hills Colorado Gas; Black Hills Energy Arkansas, Inc.; Black Hills Kansas

Gas; Black Hills Service Company; Black Hills Utility Holdings; Public Service Company of Oklahoma; City of Dubois; Peoples Gas Light and Coke Company; North Shore Gas Company; Connecticut Light and Power; New York State Electric and Gas Corporation; Rochester Gas and Electric Corporation; Greater Missouri Operations; Tennessee Valley Authority; Omaha Public Power District; Indianapolis Power & Light Company; Vermont Gas Systems, Inc.; Metropolitan Edison; Pennsylvania Electric; West Penn Power; Pennsylvania Power; PHI Service Company - Delmarva Power and Light; Atmos Energy Corporation; Citizens Energy Group; PSE&G Company; Berkshire Gas Company; Alabama Gas Corporation; Mid-Atlantic Interstate Transmission, LLC; SUEZ Water; WEC Energy Group; Rocky Mountain Natural Gas, LLC; Illinois-American Water Company; Northern Illinois Gas Company; Public Service of New Hampshire; FirstEnergy Service Corporation; Northeast Ohio Natural Gas Corporation; Blue Granite Water Company; Spire Missouri, Inc.; Dominion Energy South Carolina, Inc.; South FirstEnergy Operating Companies; Dayton Power and Light Company; Liberty Utilities; East Kentucky Power Cooperative; Bangor Natural Gas; Hanover Borough Municipal Water Works; West Virginia American Water Company; Evergy Metro; Evergy Missouri West; Granite State Electric; Bluegrass Water; The Borough of Ambler; Newtown Artesian Water Company and Connecticut Water Company.

My additional duties include determining final life and salvage estimates, conducting field reviews, presenting recommended depreciation rates to management for its consideration and supporting such rates before regulatory bodies.

Q. Have you submitted testimony to any state utility commission on the subject of utility plant depreciation?

A. Yes. I have submitted testimony to the Pennsylvania Public Utility Commission; the

Commonwealth of Kentucky Public Service Commission; the Public Utilities Commission of Ohio; the Nevada Public Utility Commission; the Public Utilities Board of NewJersey; the Missouri Public Service Commission; the Massachusetts Department of Telecommunications and Energy; the Alberta Energy & Utility Board; the Idaho Public Utility Commission; the Louisiana Public Service Commission; the State Corporation Commission of Kansas; the Oklahoma Corporate Commission; the Public Service Commission of South Carolina; Railroad Commission of Texas – Gas Services Division; the New York Public Service Commission; Illinois Commerce Commission; the Indiana Utility Regulatory Commission; the California Public Utilities Commission; the Federal Energy Regulatory Commission ("FERC"); the Arkansas Public Service Commission; the Public Utility Commission of Texas; Maryland Public Service Commission; Washington Utilities and Transportation Commission; The Tennessee Regulatory Commission; the Regulatory Commission of Alaska; Minnesota Public Utility Commission; Utah Public Service Commission; District of Columbia Public Service Commission; the Mississippi Public Service Commission; Delaware Public Service Commission; Virginia State Corporation Commission; Colorado Public Utility Commission; Oregon Public Utility Commission; South Dakota Public Utilities Commission; Wisconsin Public Service Commission; Wyoming Public Service Commission; the Public Service Commission of West Virginia; Maine Public Utility Commission; Iowa Utility Board; Connecticut Public Utilities Regulatory Authority; New Mexico Public Regulation Commission; Commonwealth of Massachusetts Department of Public Utilities; Rhode Island Public Utilities Commission and the North Carolina Utilities Commission.

Q. Have you had any additional education relating to utility plant depreciation?

A. Yes. I have completed the following courses conducted by Depreciation Programs, Inc.: