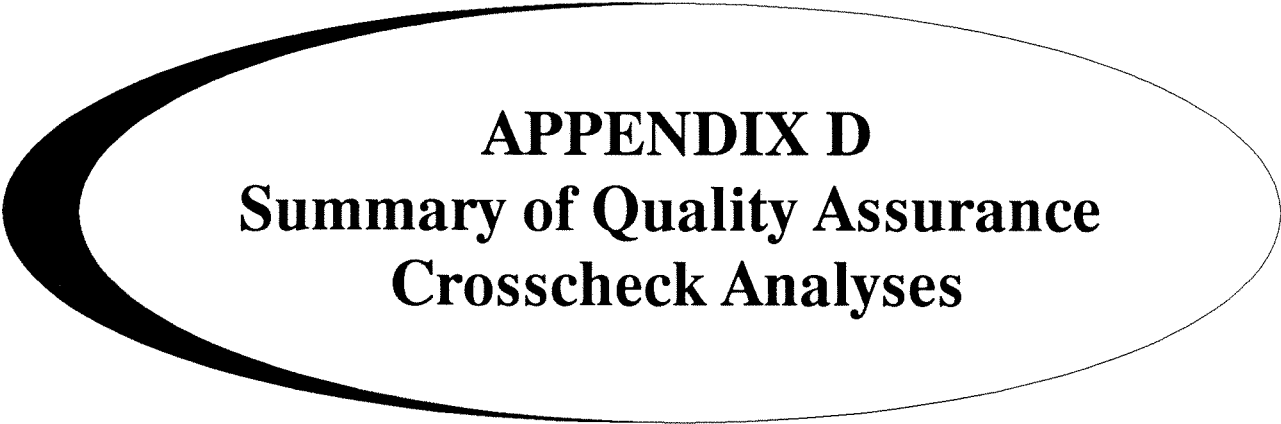




**On-screen Review of Tritium Sample Counts**

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**APPENDIX D**  
**Summary of Quality Assurance**  
**Crosscheck Analyses**

**TABLE D - 1**

**Comparison of Radiological Concentrations in Crosscheck Samples  
between the West Valley Demonstration Project and the Environmental Measurements Laboratory (EML)  
Units for air filters = pCi/filter; soil and vegetation = pCi/g; water = pCi/mL  
EML Quality Assessment Program QAP 31<sup>1</sup>**

<b>ISOTOPE</b>	<b>Matrix</b>	<b>Reported (WV)</b>	<b>Actual (EML)</b>	<b>Ratio of Rep/Act*</b>	<b>Accept?</b>
Be-7	AIR	1.00E+02	1.23E+02	0.81	YES
Mn-54	AIR	4.00E+00	4.17E+00	0.96	YES
Co-60	AIR	7.70E+00	8.17E+00	0.94	YES
Sr-90	AIR	2.10E-01	2.00E-01	1.05	YES
Cs-134	AIR	7.40E+00	9.33E+00	0.79	PASS
Cs-137	AIR	3.40E+00	3.58E+00	0.95	YES
Ce-144	AIR	7.00E+00	7.08E+00	0.99	YES
Pu-239	AIR	2.10E-01	1.80E-02	11.67	NO
Am-241	AIR	6.00E-02	1.80E-02	3.33	NO
U-238	AIR	2.00E-02	9.00E-03	2.22	NO
K-40	SOIL	5.57E+02	5.61E+02	0.99	YES
Sr-90	SOIL	4.20E+00	5.73E+00	0.73	PASS
Cs-137	SOIL	6.31E+02	6.42E+02	0.98	YES
Pu-239	SOIL	1.61E+01	1.71E+01	0.94	YES
Am-241	SOIL	3.18E+00	2.22E+00	1.43	PASS
U ( $\mu$ g)	SOIL	2.18E+00	1.71E+00	1.27	PASS
K-40	VEG	1.42E+03	1.29E+03	1.10	YES
Sr-90	VEG	7.56E+02	1.83E+03	0.41	NO
Cs-137	VEG	4.65E+01	4.79E+01	0.97	YES
U-238	VEG	4.10E-01	6.00E-01	0.68	PASS
H-3	WATER	3.86E+02	3.95E+02	0.98	YES
Mn-54	WATER	6.65E+01	6.50E+01	1.02	YES
Co-57	WATER	1.35E+02	1.35E+02	1.00	YES
Co-60	WATER	1.55E+02	1.55E+02	1.00	YES
Sr-90	WATER	3.55E+01	3.17E+01	1.12	YES
Cs-134	WATER	5.90E+01	6.83E+01	0.86	YES
Cs-137	WATER	7.05E+01	6.83E+01	1.03	YES
Ce-144	WATER	1.35E+02	1.32E+02	1.02	YES
Pu-239	WATER	2.50E-01	3.50E-01	0.71	PASS
Am-241	WATER	4.30E-01	3.33E-01	1.29	PASS
U-238	WATER	2.20E-01	1.67E-01	1.32	PASS

<sup>1</sup> Analyzed by International Technology Laboratory in December 1989. Results received in 1990.

\* Ratio of reported to actual: 1.2 - 0.8 acceptable; 1.5 - 0.5 pass.

**TABLE D - 2**

**Comparison of Radiological Concentrations in Crosscheck Samples  
between the West Valley Demonstration Project and the Environmental Measurements Laboratory (EML)  
Units for air filters = pCi/filter; soil and vegetation = pCi/g; water = pCi/mL  
EML Quality Assessment Program (QAP) 32<sup>1</sup>**

<b>ISOTOPE</b>	<b>Matrix</b>	<b>Reported (WV)</b>	<b>Actual (EML)</b>	<b>Ratio of Rep/Act*</b>	<b>Accept?</b>
Be -7	AIR	4.68E+01	5.14E+01	0.91	YES
Mn-54	AIR	1.01E+01	9.60E+00	1.05	YES
Co -57	AIR	6.52E+00	6.50E+00	1.00	YES
Co -60	AIR	9.27E+00	9.40E+00	0.99	YES
Sr -90	AIR	2.48E-01	2.40E-01	1.03	YES
Cs-134	AIR	1.66E+01	1.82E+01	0.91	YES
Cs -137	AIR	2.05E+01	2.04E+01	1.00	YES
Ce-144	AIR	3.26E+01	3.12E+01	1.04	YES
Pu-239	AIR	3.54E-02	3.90E-02	0.91	YES
Am-241	AIR	5.43E-02	5.40E-02	1.01	YES
U (Nat) <sup>2</sup>	AIR	2.20E+00	5.10E-02	43.10	NO
K - 40	SOIL	5.84E+02	6.08E+02	0.96	YES
Sr - 90	SOIL	4.13E+02	6.65E+02	0.62	PASS
Cs -137	SOIL	1.62E+04	1.75E+04	0.93	YES
Pu-239	SOIL	1.87E+02	2.12E+02	0.88	YES
Am-241	SOIL	1.12E+02	1.06E+02	1.06	YES
U (Nat) <sup>2</sup>	SOIL	1.20E+01	2.80E+02	0.04	NO
K - 40	VEG	3.34E+02	3.23E+02	1.03	YES
Sr - 90	VEG	7.44E+01	7.02E+01	1.06	YES
Cs -137	VEG	2.79E+01	2.85E+01	0.98	YES
Pu -239	VEG	4.86E-01	3.33E-01	1.46	PASS
Am -241	VEG	1.31E+00	3.07E-01	4.27	NO
U (Nat) <sup>2</sup>	VEG	9.68E-02	1.06E+00	0.09	NO
H-3	WATER	1.90E+03	1.96E+03	0.97	YES
Mn -54	WATER	1.07E+02	1.03E+02	1.04	YES
Co -57	WATER	1.95E+02	1.98E+02	0.98	YES
Co - 60	WATER	1.84E+02	2.06E+02	0.89	YES
Sr - 90	WATER	8.29E+01	1.11E+02	0.75	PASS
Cs - 134	WATER	4.17E+02	4.62E+02	0.90	YES
Cs -137	WATER	1.91E+02	1.98E+02	0.96	YES
Ce -144	WATER	4.50E+02	4.03E+02	1.12	YES
Pu -239	WATER	1.21E+00	1.04E+00	1.16	YES
Am - 241	WATER	8.82E-01	8.60E-01	1.03	YES
U - 238	WATER	7.14E-02	1.00E+00	0.07	NO

<sup>1</sup> Analyzed by International Technology.

<sup>2</sup> Units reported by WVNS as  $\mu\text{g}$ ; reported by EML as pCi

\* Ratio of reported to actual: 1.2 - 0.8 acceptable; 1.5 - 0.5. pass.

**TABLE D - 3**

**Comparison of Radiological Concentrations in Crosscheck Samples  
between the West Valley Demonstration Project and the Environmental Measurements Laboratory (EML)  
Units for air filters = pCi/filter; soil and vegetation = pCi/g; water = pCi/mL  
EML Quality Assessment Program (QAP) 33<sup>1</sup>**

ISOTOPE	Matrix	Reported (WV)	Actual (EML)	Ratio of Rep/Act*	Accept?
Mn-54	AIR	3.55E+01	3.33E+01	1.07	YES
Co-57	AIR	1.25E+01	1.14E+01	1.10	YES
Co-60	AIR	2.38E+01	2.54E+01	0.94	YES
Sr-90	AIR	1.55E-01	9.30E-02	1.67	NO
Cs-134	AIR	1.71E+01	1.63E+01	1.05	YES
Cs-137	AIR	1.64E+01	1.57E+01	1.04	YES
Ce-144	AIR	1.78E+01	1.65E+01	1.08	YES
Pu-239	AIR	4.65E-02	5.10E-02	0.91	YES
Am-241	AIR	4.35E-02	3.60E-02	1.21	PASS
U (Nat)	AIR	1.14E+00	9.85E-01	1.16	YES
K-40	SOIL	5.45E+02	5.13E+02	1.06	YES
Sr-90	SOIL	6.30E+00	8.33E+00	0.76	PASS
Cs-137	SOIL	2.01E+02	1.96E+02	1.03	YES
Pu-239	SOIL	1.30E+00	1.15E+00	1.13	YES
Am-241	SOIL	1.50E+00	7.38E-01	2.03	NO
U (Nat)	SOIL	2.10E+00	2.19E+00	0.96	YES
K-40	VEG	1.09E+03	1.03E+03	1.06	YES
Sr-90	VEG	7.60E+02	8.89E+02	0.85	YES
Cs-137	VEG	1.90E+01	1.82E+01	1.04	YES
Pu-239	VEG	1.07E-01	9.58E-02	1.12	YES
H-3	WATER	4.24E+03	3.90E+03	1.09	YES
Mn-54	WATER	3.06E+02	3.01E+02	1.02	YES
Co-57	WATER	1.41E+03	1.30E+03	1.08	YES
Co-60	WATER	5.09E+02	4.91E+02	1.04	YES
Sr-90	WATER	1.15E+01	9.93E+00	1.16	YES
Cs-134	WATER	3.63E+02	3.55E+02	1.02	YES
Cs-137	WATER	4.03E+02	3.90E+02	1.03	YES
Ce-144	WATER	9.17E+02	9.23E+02	0.99	YES
Pu-239	WATER	8.70E-01	1.09E+00	0.80	YES
Am-241	WATER	5.50E-01	5.67E-01	0.97	YES
U-238	WATER	2.00E-02	1.89E-02	1.06	YES

<sup>1</sup> Analyzed by International Technology Laboratory.

\* Ratio of reported to actual: 1.2 - 0.8 acceptable; 1.5 - 0.5 pass.

**TABLE D - 4**

**Comparison of Radiological Parameters in pCi/L in Crosscheck Samples  
between the West Valley Demonstration Project and the U.S. Environmental Protection Agency's  
Environmental Monitoring Systems Laboratory (EMSL) in 1990**

<b>SAMPLE</b>	<b>Analyte</b>	<b>Matrix</b>	<b>Reported (WVDP)</b>	<b>Actual (EMSL)</b>	<b>Accept?*</b>
<b>PE - A</b> <b>(April 1990)</b>	ALPHA	WATER	68.67	90.00	YES
	RA-226	WATER	7.37	5.00	NO
	RA-228	WATER	16.40	10.20	NO
	U (NAT)	WATER	20.67	20.00	YES
<b>PE - B</b> <b>(April 1990)</b>	BETA	WATER	52.33	52.00	YES
	SR-89	WATER	10.67	10.00	YES
	SR-90	WATER	10.67	10.00	YES
	CS-134	WATER	13.67	15.00	YES
	CS-137	WATER	17.00	15.00	YES
<b>PE - A</b> <b>(October 1990)</b>	ALPHA	WATER	52.33	62.00	YES
	RA-226	WATER	11.23	13.60	PASS
	RA-228	WATER	2.97	5.00	PASS
	U (NAT)	WATER	10.67	10.20	YES
<b>PE - B</b> <b>(October 1990)</b>	BETA	WATER	54.00	53.00	YES
	SR-89	WATER	19.67	20.00	YES
	SR-90	WATER	15.00	15.00	YES
	CS-134	WATER	6.67	7.00	YES
	CS-137	WATER	5.33	5.00	YES
<b>GAM</b> <b>(February 1990)</b>	CO-60	WATER	18.00	15.00	YES
	ZN-65	WATER	130.00	139.00	YES
	RU-106	WATER	114.67	139.00	NO
	CS-134	WATER	17.00	18.00	YES
	CS-137	WATER	19.00	18.00	YES
	BA-133	WATER	61.33	74.00	NO
<b>GAM</b> <b>(June 1990)</b>	CO-60	WATER	23.00	24.00	YES
	ZN-65	WATER	132.67	148.00	YES
	RU-106	WATER	167.00	210.00	NO
	CS-134	WATER	20.00	24.00	YES
	CS-137	WATER	22.67	25.00	YES
	BA-133	WATER	78.67	99.00	NO
<b>TRW</b> <b>(February 1990)</b>	H-3	WATER	4599.33	4976.00	YES

**Explanation of codes:**

ABW: Alpha and beta in water

AF: Air filters

GAM: Gamma in water

NA: Not applicable

NR: Not reported

PE: Performance Evaluation

PE - A: Performance Evaluation (Alpha)

PE - B: Performance Evaluation (Beta)

PUW: Plutonium in water

TRW: Tritium in water

**TABLE D - 4 (continued)**

**Comparison of Radiological Parameters in pCi/L in Crosscheck Samples  
between the West Valley Demonstration Project and the U.S. Environmental Protection Agency's  
Environmental Monitoring Systems Laboratory (EMSL) in 1990**

<b>SAMPLE</b>	<b>Analyte</b>	<b>Matrix</b>	<b>Reported (WVDP)</b>	<b>Actual (EMSL)</b>	<b>Accept?*</b>
<b>AF</b> (March 1990)	ALPHA	FILTER	6.00	5.00	YES
	BETA	FILTER	31.67	31.00	YES
	SR-90	FILTER	11.00	10.00	YES
	CS-137	FILTER	12.00	10.00	YES
<b>AF</b> (August 1990)	ALPHA	FILTER	11.00	10.00	YES
	BETA	FILTER	65.00	62.00	YES
	SR-90	FILTER	21.00	20.00	YES
	CS-137	FILTER	21.67	20.00	YES
<b>MILK</b> (April 1990)	SR-89	MILK	NR	23.00	NA
	SR-90	MILK	NR	23.00	NA
	I-131	MILK	109.33	99.00	YES
	CS-137	MILK	23.67	24.00	YES
	TOTAL K	MILK	1650.33	1550.00	PASS
<b>MILK</b> (September 1990)	SR-89	MILK	16.00	16.00	YES
	SR-90	MILK	16.33	20.00	YES
	I-131	MILK	52.00	58.00	YES
	CS-137	MILK	23.00	20.00	YES
	TOTAL K	MILK	1920.00	1700.00	NO
<b>ABW</b> (May 1990)	ALPHA	WATER	12.33	22.00	PASS
	BETA	WATER	16.00	15.00	YES
<b>ABW</b> (September 1990)	ALPHA	WATER	7.00	10.00	YES
	BETA	WATER	10.33	10.00	YES
<b>PUW</b> (August 1990)	PU-239	WATER	7.57	9.10	PASS

**Explanation of codes:**

ABW: Alpha and beta in water  
 AF: Air filters  
 GAM: Gamma in water  
 NA: Not applicable  
 NR: Not reported

PE: Performance Evaluation  
 PE - A: Performance Evaluation (Alpha)  
 PE - B: Performance Evaluation (Beta)  
 PUW: Plutonium in water  
 TRW: Tritium in water

\* Acceptable range determined by EMSL

**TABLE D - 5**

**Comparison of Water Quality Parameters in Crosscheck Samples, Study 10,  
between the West Valley Demonstration Project and the Environmental Protection Agency (EPA)**

<b>ANALYTE <sup>1</sup></b>		<b>Reported (WVDP)</b>	<b>Actual (EPA)</b>	<b>Accept?*</b>
AL	( $\mu\text{g/L}$ )	810	750	YES
AS	( $\mu\text{g/L}$ )	140	180	PASS
BE	( $\mu\text{g/L}$ )	190	180	YES
CD	( $\mu\text{g/L}$ )	120	110	YES
CR	( $\mu\text{g/L}$ )	640	700	YES
CO	( $\mu\text{g/L}$ )	280	300	YES
CU	( $\mu\text{g/L}$ )	510	500	YES
FE**	( $\mu\text{g/L}$ )	1640	1650	YES
PB	( $\mu\text{g/L}$ )	160	275	NO
MN	( $\mu\text{g/L}$ )	600	650	PASS
HG	( $\mu\text{g/L}$ )	1.3	1.25	YES
NI	( $\mu\text{g/L}$ )	820	800	YES
SE	( $\mu\text{g/L}$ )	13	16.0	YES
VA	( $\mu\text{g/L}$ )	1800	1900	YES
ZN	( $\mu\text{g/L}$ )	540	550	YES
pH***		8.49	8.50	YES
TSS***	( $\text{mg/L}$ )	58.9	60.0	YES
O&G	( $\text{mg/L}$ )	8.9	10.0	YES
NH-3***	( $\text{mg/L}$ )	10.9	11.0	YES
NO-3	( $\text{mg/L}$ )	7.3	06.5	YES
TOC	( $\text{mg/L}$ )	20	20.2	YES
BOD-5***	( $\text{mg/L}$ )	32.8	33.2	YES
CN	( $\text{mg/L}$ )	.75	00.7	YES
PHENOLICS	( $\text{mg/L}$ )	.52	00.531	YES

<sup>1</sup> Unless indicated otherwise, analyses performed by RECRA Environmental, Inc.

\* Acceptable ranges determined by the Environmental Protection Agency

\*\* Analyzed by WVDP Analytical and Process Chemistry Laboratory

\*\*\* Analyzed by WVDP Environmental Laboratory



**TABLE D - 6**

**Comparison of Water Quality Parameters in Crosscheck Samples between  
the West Valley Demonstration Project and the New York State Department of Health (NYSDOH) in 1990**

<b>ANALYTE</b>		<b>Reported (WVDP)</b>	<b>Actual (NYSDOH)</b>	<b>Accept?*</b>
<b>BOD-5</b>	<b>(mg/L)</b>	20.3	20.2	YES
		84.5	82.4	YES
		24.5	24.6	YES
		73.2	72.7	YES
<b>TSS</b>	<b>(mg/L)</b>	33.5	34.2	YES
		70	68.8	YES
		18	18.8	YES
		49.2	47.6	YES
<b>pH</b>		2.93	3.00	YES
		9.45	9.38	YES
		5.38	5.46	PASS
		7.92	7.90	YES
<b>NH-3</b>	<b>(mg/L)</b>	3.05	3.06	YES
		4.18	4.19	YES
		2.07	1.97	YES
		4.17	3.92	YES

\* Acceptable range determined by NYSDOH

**TABLE D - 7**

**Comparison of the West Valley Demonstration Project's Thermoluminescent Dosimeters (TLDs)  
to the Co-located Nuclear Regulatory Commission TLDs in 1990**

**1ST QTR**

NRC TLD#	WVDP TLD#	$\mu$ R/hr NRC	$\mu$ R/hr WVDP	WVDP/NRC	ACCEPT?
2	22	7.5	8.8	1.17	YES
3	5	7.5	7.9	1.05	YES
4	7	7.0	7.5	1.07	YES
5	9	8.7	6.2	.71	PASS
7	14	8.4	8.1	.96	YES
8	15	8.3	6.9	.83	YES
9	25	15.6	15.9	1.02	YES
11	24	554.2	652.6	1.18	YES

**2ND QTR**

NRC TLD#	WVDP TLD#	$\mu$ R/hr NRC	$\mu$ R/hr WVDP	WVDP/NRC	ACCEPT?
2	22	8.6	8.5	.99	YES
3	5	7.8	8.9	1.14	YES
4	7	7.8	8.2	1.05	YES
5	9	10.1	8.1	.80	YES
7	14	N/A	9.8	N/A	N/A
8	15	8.1	8.8	1.09	YES
9	25	17.8	15.6	.88	YES
11	24	582.4	621.4	1.07	YES

**3RD QTR**

NRC TLD#	WVDP TLD#	$\mu$ R/hr NRC	$\mu$ R/hr WVDP	WVDP/NRC	ACCEPT?
2	22	7.6	9.6	1.26	PASS
3	5	8.2	10.5	1.27	PASS
4	7	8.3	8.9	1.07	YES
5	9	9.0	9.2	1.02	YES
7	14	8.4	10.7	1.27	PASS
8	15	N/A	9.9	N/A	N/A
9	25	16.6	17.3	1.04	YES
11	24	548.1	617.4	1.13	YES

**4TH QTR**

NRC TLD#	WVDP TLD#	$\mu$ R/hr NRC	$\mu$ R/hr WVDP	WVDP/NRC	ACCEPT?
2	22	7.3	8.8	1.20	YES
3	5	N/A.	9.5	N/A.	N/A.
4	7	7.6	8.7	1.14	YES
5	9	9.7	8.7	.90	YES
7	14	7.3	9.5	1.31	PASS
8	15	7.2	9.4	1.30	PASS
9	25	15.8	15.3	.97	YES
11	24	N/A	622.4	N/A	N/A

\* Ratio of reported to actual: 1.2-0.8 acceptable; 1.5-0.5 pass  
N/A Not available