APPENDIX E
SUMMARY OF GROUNDWATER MONITORING

TABLE E-1
SUPPORTING GROUNDWATER MONITORING STATIONS
SAMPLED DURING 1987

LOCATION CODE	QUARTER SAMPLED	PH	CONDUCTIVITY @ 25 °C µmhos/cm	µCi/mL ALPHA	BETA	TRITIUM	Cs-137
				WELLS NEAR SITE FACILITIES			
WNW80-3	FIRST	7.12	648	<1.25E-09	3.26E-07 ± 0.11E-07	2.99E-07 ± 1.16E-07	<4.2E-08
WNW80-3	SECOND	6.95	571	<2.29E-09	2.51E-07 ± 0.07E-07	2.26E-07 ± 1.12E-07	<4.2E-08
WNW80-3	THIRD	7.00	495	<2.06E-09	2.84E-07 ± 0.10E-07	1.76E-06 ± 1.08E-07	<4.2E-08
WNW80-4	FIRST	7.44	553	<1.34E-09	7.39E-09 ± 2.38E-09	5.38E-07 ± 1.29E-07	<4.2E-08
WNW80-4	SECOND	7.08	580	<9.66E-10	5.14E-09 ± 1.31E-09	1.40E-06 ± 0.15E-07	<4.2E-08
WNW80-4	THIRD	7.27	736	<1.75E-09	1.83E-08 ± 0.31E-08	9.52E-07 ± 1.31E-07	<4.2E-08
				WELLS NEAR NRC DISPOSAL UNIT			
WNW82-1A	FIRST	7.24	1196	1.24E-08 ± 0.80E-08	3.14E-09 ± 2.19E-09	not available	<4.2E-08
WNW82-1A	SECOND	7.00	1237	5.14E-09 ± 4.76E-09	8.67E-09 ± 1.75E-09	7.70E-07 ± 1.23E-07	<4.2E-08
WNW82-1A	THIRD	7.16	1226	<3.69E-09	2.69E-09 ± 2.02E-09	4.91E-07 ± 1.13E-07	<4.2E-08
WNW82-1B	FIRST	7.10	1456	<5.11E-09	6.75E-09 ± 2.64E-09	not available	<4.2E-08
WNW82-1B	SECOND	7.00	1448	<5.71E-09	4.65E-09 ± 1.75E-09	4.14E-07 ± 1.09E-07	<4.2E-08
WNW82-1B	THIRD	7.00	1397	<3.96E-09	5.92E-09 ± 2.43E-09	6.88E-07 ± 1.17E-07	<4.2E-08
WNW82-1C	FIRST	7.65	504	1.18E-07 ± 0.47E-07	1.48E-07 ± 0.13E-07	not available	<4.2E-08
WNW82-1C	SECOND	7.48	483	2.32E-08 ± 1.26E-08	4.47E-08 ± 0.54E-08	<1.0E-07	<4.2E-08
WNW82-1C	THIRD	7.78	462	1.65E-08 ± 1.16E-08	4.30E-08 ± 0.52E-08	<1.0E-07	<4.2E-08
WNW82-2B	FIRST	7.34	795	1.14E-07 ± 0.49E-07	1.77E-07 ± 0.15E-07	not available	<4.2E-08
WNW82-2B	SECOND	7.17	793	6.28E-08 ± 2.34E-08	1.03E-07 ± 0.06E-07	<1.0E-07	<4.2E-08
WNW82-2B	THIRD	7.47	781	8.07E-08 ± 3.02E-08	2.18E-07 ± 0.15E-07	<1.0E-07	<4.2E-08
WNW82-2C	THIRD	9.25	692	2.24E-08 ± 1.81E-08	6.02E-08 ± 0.95E-08	<1.0E-07	<4.2E-08
WNW82-3A	FIRST	7.47	768	<5.33E-09	2.55E-08 ± 0.37E-08	not available	<4.2E-08
WNW82-3A	SECOND	7.25	523	1.02E-08 ± 0.58E-08	2.88E-08 ± 0.27E-08	<1.0E-07	<4.2E-08
WNW82-3A	THIRD	7.69	692	1.50E-07 ± 0.60E-07	2.58E-07 ± 0.16E-07	4.01E-07 ± 1.30E-07	<4.2E-08
WNW82-4A1	FIRST	6.81	1301	<3.8 E-09	6.51E-09 ± 2.71E-09	not available	<4.2E-08
WNW82-4A1	SECOND	6.69	1346	<3.81E-09	5.08E-09 ± 1.54E-09	2.48E-05 ± 0.08E-05	<4.2E-08
WNW82-4A1	THIRD	6.89	1319	<6.04E-09	1.11E-08 ± 0.30E-08	2.29E-05 ± 0.07E-05	<4.2E-08
WNW82-4A2	FIRST	6.82	1484	<7.12E-09	8.55E-09 ± 2.99E-09	not available	<4.2E-08
WNW82-4A2	SECOND	6.72	1544	<3.61E-09	7.11E-09 ± 1.70E-09	3.83E-07 ± 1.10E-07	<4.2E-08
WNW82-4A2	THIRD	6.77	1465	<3.31E-09	7.96E-09 ± 2.89E-09	<1.0E-07	<4.2E-08
WNW82-4A3	FIRST	6.85	1460	<9.10E-09	1.08E-08 ± 0.36E-08	not available	<4.2E-08
WNW82-4A3	SECOND	6.70	1450	<2.10E-09	6.52E-09 ± 1.68E-09	3.55E-07 ± 1.10E-07	<4.2E-08
WNW82-4A3	THIRD	6.74	1440	<3.33E-09	6.59E-09 ± 2.79E-09	1.45E-07 ± 1.15E-07	<4.2E-08

TABLE E-2
1987 FUEL TANK GROUNDWATER MONITORING

PARAMETER	WNW86-13 FIRST QTR	WNW68-13 SECOND QTR	WNW86-13 THIRD QTR	WNW86-13 FOURTH QTR
pH	7.15	6.85	7.15	7.19
CONDUCTIVITY (μmhos/cm)	702	667	673	675
TOC (mg/L)	8.7	8.7	<1.0	4.7
PHENOLS (mg/L)	<0.01	<0.01	<0.01	<0.01
BENZENE (μg/L)			<0.2	<0.2
TOLUENE (μg/L)			<0.2	<0.2
o-XYLENE (μg/L)			<0.2	<0.2
m-XYLENE (μg/L)			<0.2	<0.2
p-XYLENE (μg/L)			<0.2	<0.2
ALPHA (μCi/mL)	<2.23E-09	<1.49E-09	<9.55E-10	<3.22E-09
BETA (μCi/mL)	3.01E-09 ± 2.01E-0	3.99E-09 ± 1.21E-09	4.36E-09 ± 2.06E-09	5.14E-09 ± 2.27E-09
TRITIUM (μCi/mL)	<1.0E-07	2.20E-07 ± 1.10E-07	1.21E-07 ± 1.05E-07	<1.0E-07

TABLE E-3
1987 WATER QUALITY PARAMETERS FOR
HIGH-LEVEL RADIOACTIVE WASTE TANK COMPLEX
GROUNDWATER MONITORING UNIT

LOCATION CODE	QUARTER SAMPLED	pH	CONDUCTIVITY (@25 °C) (µmhos/cm)	mg/L TOC	PHENOL	CHLORIDE	NITRATE	SULFATE	FLUORIDE
UNW80-02	FIRST	7.97	306	13.0	0.02	20.0	2.75	9.6	<0.20
UNW80-02	SECOND	8.14	309	1.0	<0.010	24.7	1.71	10.0	0.26
UNW80-02	THIRD	7.80	340	0.9	<0.010	30.9	1.88	10.8	<1.75
UNW80-02	FOURTH	7.77	347	1.0	<0.010	23.6	2.09	10.6	0.10
UNW86-07	FIRST	7.01	944	6.0	0.013	26.8	4.76	156.8	0.46
UNW86-07	SECOND	6.61	869	4.2	<0.010	33.0	5.97	176.8	0.41
UNW86-07	THIRD	6.70	961	1.2	<0.010	20.3	1.12	171.8	0.14
UNW86-07	FOURTH	6.71	957	1.1	<0.010	15.8	1.23	191.1	<0.20
UNW86-08	FIRST	6.78	1213	11.2	0.018	161.3	<0.10	180.3	<0.20
UNW86-08	SECOND	6.95	935	5.4	<0.010	65.2	<0.10	177.1	0.27
UNW86-08	THIRD	6.65	792	21.8	<0.010	24.9	<0.10	193.9	<0.10
UNW86-08	FOURTH	6.79	776	1.8	<0.010	24.6	<0.10	179.5	<0.20
UNW86-09	FIRST	7.29	681	12.2	0.015	33.1	7.98	34.4	0.29
UNW86-09	SECOND	7.21	686	4.9	<0.010	34.0	5.63	35.3	0.12
UNW86-09	THIRD	7.25	661	1.4	<0.010	35.2	6.56	36.1	<0.10
UNW86-09	FOURTH	6.83	677	1.0	<0.010	41.4	7.29	34.0	<0.20
UNDMPNE*	FIRST	6.61	333	11.5	0.028	13.1	3.17	26.6	<0.20
UNDMPNE	SECOND	6.86	651	2.0	<0.015	64.3	3.80	52.9	<0.20
UNDMPNE	THIRD	6.93	647	3.8	0.010	69.6	2.71	52.2	<0.10
UNDMPNE	FOURTH	6.61	572	5.1	<0.010	42.4	4.38	55.0	<0.20
UNW86-12*	FIRST	7.37	526	2.7	<0.010	23.3	<0.20	48.4	0.51
UNW86-12	SECOND	7.67	538	1.1	<0.010	29.6	<1.00	46.1	<0.20
UNW86-12	THIRD	7.64	394	1.7	<0.013	33.8	0.23	51.7	<0.10
UNW86-12	FOURTH	7.37	567	1.3	<0.010	39.6	<0.10	53.9	<0.20

Notes: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

* Monitoring wells near former cold dump.

TABLE E-4
1987 TOTAL METALS FOR
HIGH-LEVEL RADIOACTIVE WASTE TANK COMPLEX
GROUNDWATER MONITORING UNIT
(mg/L)

LOCATION CODE	QUARTER SAMPLED	ARSENIC	BARIUM	CADMIUM	CHROMIUM	IRON	LEAD	MANGANESE	MERCURY	SELENIUM	SILVER	SODIUM
WNW80-02	FIRST	<0.001	0.05	<0.001	0.005	0.51	0.047	0.03	<0.0100	<0.001	0.001	2.8
WNW80-02	SECOND	0.008	0.12	0.005	0.034	6.20	0.017	0.20	<0.0005	<0.005	<0.005	5.0
WNW80-02	THIRD	<0.005	0.08	<0.008	0.013	4.30	0.004	0.26	<0.0005	<0.005	<0.005	4.8
WNW80-02	FOURTH	<0.005	0.07	<0.005	<0.005	0.18	0.058	0.05	<0.0005	<0.005	<0.005	< 5.0
WNW86-07	FIRST	<0.010	0.04	<0.010	<0.10	2.62	0.010	0.31	<0.0100	0.009	<0.010	9.1
WNW86-07	SECOND	<0.005	0.07	0.005	0.008	0.37	0.006	0.15	<0.0005	<0.005	<0.005	7.5
WNW86-07	THIRD	<0.005	<0.08	<0.006	0.005	0.13	<0.005	0.26	<0.0005	<0.005	<0.005	9.0
WNW86-07	FOURTH	<0.005	0.10	0.006	0.005	0.49	<0.040	0.21	<0.0005	<0.005	<0.005	12.5
WNW86-08	FIRST	<0.010	0.62	<0.010	0.020	7.21	0.153	24.22	<0.0100	0.010	<0.010	10.5
WNW86-08	SECOND	<0.005	0.13	<0.005	0.020	1.65	0.005	8.25	<0.0005	<0.005	<0.005	10.0
WNW86-08	THIRD	<0.005	0.10	<0.006	0.005	1.40	<0.005	10.08	<0.0005	<0.005	<0.005	8.3
WNW86-08	FOURTH	<0.005	0.09	<0.005	<0.005	0.72	<0.040	5.48	<0.0005	<0.005	<0.005	7.0
WNW86-09	FIRST	***DATA NOT AVAILABLE***										
WNW86-09	SECOND	0.005	0.21	0.015	0.027	4.18	0.011	0.14	<0.0005	<0.005	<0.005	8.0
WNW86-09	THIRD	<0.005	0.21	<0.006	0.005	2.83	0.005	0.25	<0.0005	<0.005	0.005	6.3
WNW86-09	FOURTH	<0.005	0.21	0.005	0.004	1.90	0.043	0.19	<0.0005	<0.005	<0.005	7.0
WNDMPNE*	FIRST	0.008	0.09	<0.001	0.010	2.77	0.031	0.11	<0.0100	<0.001	0.001	2.9
WNDMPNE	SECOND	0.008	0.11	<0.005	0.012	0.39	<0.005	0.03	<0.0005	<0.005	<0.005	20.0
WNDMPNE	THIRD	<0.005	0.09	<0.008	0.004	0.05	0.003	0.01	<0.0005	<0.005	<0.005	14.8
WNDMPNE	FOURTH	<0.005	0.08	0.006	<0.005	0.16	<0.040	0.02	<0.0005	<0.005	<0.005	12.3
WNW86-12*	FIRST	0.000	0.21	<0.001	0.004	0.31	0.028	0.06	<0.0020	0.003	0.008	9.0
WNW86-12	SECOND	<0.005	0.26	<0.005	0.006	0.24	<0.005	0.07	<0.0005	<0.005	<0.005	10.0
WNW86-12	THIRD	<0.005	0.30	<0.008	0.005	0.26	0.009	0.08	0.0003	<0.005	0.007	11.0
WNW86-12	FOURTH	<0.005	0.26	<0.007	<0.005	0.25	0.013	0.07	<0.0005	<0.005	<0.005	10.8

Notes: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

* Monitoring wells near former cold dump.

TABLE E-5
1987 DISSOLVED METALS FOR
HIGH-LEVEL RADIOACTIVE WASTE TANK COMPLEX
GROUNDWATER MONITORING UNIT
(mg/L)

LOCATION CODE	QUARTER SAMPLED	ARSENIC	BARIUM	CADMIUM	CHROMIUM	IRON	LEAD	MANGANESE	MERCURY	SELENIUM	SILVER	SODIUM
WNW80-02	FIRST	<0.001	0.06	<0.001	0.004	0.07	0.037	0.01	<0.0100	0.003	<0.001	3.2
WNW80-02	SECOND	<0.005	0.06	<0.005	<0.006	0.03	<0.005	0.09	<0.0007	<0.005	<0.005	5.0
WNW80-02	THIRD	<0.005	0.07	<0.005	<0.005	0.27	<0.005	0.42	<0.0005	<0.005	<0.005	4.8
WNW80-02	FOURTH	<0.005	0.08	<0.005	0.004	0.04	<0.020	0.05	<0.0005	<0.005	<0.005	<5.0
WNW86-07	FIRST	<0.001	0.07	<0.001	0.001	0.02	0.002	0.22	<0.0010	0.009	<0.001	8.5
WNW86-07	SECOND	<0.005	0.06	<0.005	<0.006	<0.02	<0.005	0.06	<0.0005	<0.005	<0.005	7.8
WNW86-07	THIRD	<0.005	<0.08	<0.005	<0.005	<0.03	<0.005	0.21	<0.0005	<0.005	<0.005	14.8
WNW86-07	FOURTH	<0.005	0.07	<0.005	<0.005	0.02	0.021	0.19	<0.0005	<0.005	<0.005	11.5
WNW86-08	FIRST	<0.001	0.14	<0.001	0.014	2.88	0.023	25.24	0.0033	<0.001	0.002	8.8
WNW86-08	SECOND	<0.005	0.11	<0.005	<0.006	0.34	<0.005	5.60	<0.0005	<0.005	<0.005	10.0
WNW86-08	THIRD	0.005	0.08	<0.005	<0.005	1.40	<0.005	13.25	<0.0005	<0.005	<0.005	8.3
WNW86-08	FOURTH	<0.005	0.10	<0.005	<0.005	0.28	<0.030	7.88	<0.0005	<0.005	<0.005	7.0
WNW86-09	FIRST	<0.001	0.13	<0.001	0.000	0.02	0.002	0.04	0.0010	0.006	<0.001	4.9
WNW86-09	SECOND	<0.005	0.17	<0.005	<0.006	0.02	<0.005	0.07	<0.0005	<0.005	<0.005	8.5
WNW86-09	THIRD	<0.005	0.18	<0.005	<0.005	<0.03	<0.005	<0.01	<0.0005	<0.005	<0.005	6.8
WNW86-09	FOURTH	<0.005	0.21	<0.005	<0.005	0.03	<0.030	0.01	<0.0005	<0.005	<0.005	7.0
WNDMPNE*	FIRST	<0.010	0.05	<0.010	<0.010	0.05	0.010	0.01	<0.0100	<0.010	<0.010	2.8
WNDMPNE	SECOND	<0.005	0.10	<0.005	<0.005	<0.02	<0.005	0.02	<0.0005	<0.005	<0.005	20.0
WNDMPNE	THIRD	<0.005	0.09	<0.005	<0.005	<0.05	<0.005	0.01	<0.0005	<0.005	<0.005	15.0
WNDMPNE	FOURTH	<0.005	0.07	<0.005	<0.005	0.02	<0.030	0.01	<0.0005	<0.005	<0.005	12.5
WNW86-12*	FIRST	<0.001	0.22	<0.001	0.003	0.21	0.033	0.06	0.0010	0.006	0.007	9.7
WNW86-12	SECOND	<0.005	0.25	<0.005	<0.005	0.18	<0.005	0.07	<0.0005	<0.005	<0.005	10.0
WNW86-12	THIRD	<0.005	0.30	<0.005	<0.005	0.26	<0.005	0.07	<0.0005	<0.005	<0.005	11.0
WNW86-12	FOURTH	<0.005	0.25	<0.005	<0.005	0.25	<0.030	0.08	<0.0005	<0.005	<0.005	11.5

Notes: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

* Monitoring wells near former cold dump.

TABLE E-6

1987 RADIOACTIVITY CONCENTRATIONS FOR GROUNDWATER

IN HIGH-LEVEL RADIOACTIVE WASTE TANK COMPLEX MONITORING UNIT

(μCi/mL)

LOCATION CODE	QUARTER SAMPLED	ALPHA	BETA	Tritium (H-3)	Cs-137	Co-60
WNW80-02	FIRST	<1.13E-09	<1.64E-09	<1.00E-07	<1.08E-07	<1.09E-07
WNW80-02	SECOND	1.29E-09 ± 7.07E-10	5.58E-09 ± 6.77E-10	<1.00E-07	<1.08E-07	<1.09E-07
WNW80-02	THIRD	<1.58E-09	2.01E-09 ± 6.75E-10	1.23E-07 ± 5.42E-08	<1.08E-07	<1.09E-07
WNW80-02	FOURTH	<1.05E-09	7.63E-10 ± 6.96E-10	<1.00E-07	<1.08E-07	<1.09E-07
WNW86-07	FIRST	<6.00E-09	5.56E-09 ± 1.22E-09	4.61E-07 ± 6.84E-08	<1.08E-07	<1.09E-07
WNW86-07	SECOND	2.17E-09 ± 1.27E-09	7.37E-09 ± 8.08E-10	2.30E-07 ± 5.66E-08	<1.08E-07	<1.09E-07
WNW86-07	THIRD	<2.11E-09	5.17E-09 ± 7.92E-10	1.57E-07 ± 5.37E-08	<1.08E-07	<1.09E-07
WNW86-07	FOURTH	<2.95E-09	3.77E-09 ± 1.01E-09	<1.00E-07	<1.08E-07	<1.09E-07
WNW86-08	FIRST	<5.15E-09	3.85E-09 ± 1.17E-09	4.13E-06 ± 1.34E-07	<1.08E-07	<1.09E-07
WNW86-08	SECOND	4.77E-09 ± 1.80E-09	2.82E-08 ± 1.40E-09	3.66E-06 ± 9.17E-08	<1.08E-07	<1.09E-07
WNW86-08	THIRD	<1.85E-09	1.03E-08 ± 9.17E-10	1.15E-06 ± 9.71E-07	<1.08E-07	<1.09E-07
WNW86-08	FOURTH	<2.33E-09	7.33E-09 ± 1.13E-09	5.80E-06 ± 2.60E-07	<1.08E-07	<1.09E-07
WNW86-09	FIRST	1.39E-08 ± 5.47E-09	1.19E-07 ± 3.03E-09	3.34E-06 ± 9.63E-08	<1.08E-07	<1.09E-07
WNW86-09	SECOND	8.89E-09 ± 2.13E-09	1.03E-07 ± 2.49E-09	3.45E-06 ± 9.15E-08	<1.08E-07	<1.09E-07
WNW86-09	THIRD	2.04E-09 ± 1.57E-09	1.45E-07 ± 3.13E-09	2.26E-06 ± 9.43E-08	<1.08E-07	<1.09E-07
WNW86-09	FOURTH	<2.74E-09	1.45E-07 ± 3.20E-09	3.90E-06 ± 2.20E-07	<1.08E-07	<1.09E-07
WNDMPNE*	FIRST	2.49E-09 ± 1.99E-09	6.82E-08 ± 2.51E-09	1.75E-07 ± 5.43E-08	<1.08E-07	<1.09E-07
WNDMPNE	SECOND	3.25E-09 ± 1.23E-09	9.89E-08 ± 2.30E-09	9.94E-07 ± 6.53E-08	<1.08E-07	<1.09E-07
WNDMPNE	THIRD	<1.44E-09	9.61E-08 ± 2.36E-09	8.07E-07 ± 6.25E-08	<1.08E-07	<1.09E-07
WNDMPNE	FOURTH	<1.69E-09	1.32E-07 ± 3.28E-09	5.67E-07 ± 1.20E-08	<1.08E-07	<1.09E-07
WNW86-12*	FIRST	<1.58E-09	1.70E-09 ± 9.27E-10	5.46E-06 ± 1.24E-07	<1.08E-07	<1.09E-07
WNW86-12	SECOND	<9.86E-10	1.20E-09 ± 5.05E-10	4.82E-06 ± 1.15E-07	<1.08E-07	<1.09E-07
WNW86-12	THIRD	<1.31E-09	1.46E-09 ± 6.51E-10	5.03E-06 ± 1.18E-07	<1.08E-07	<1.09E-07
WNW86-12	FOURTH	<1.92E-09	1.45E-09 ± 8.27E-10	4.51E-06 ± 2.20E-07	<1.08E-07	<1.09E-07

Note: Each entry represents the average of four replicate measurements per quarter.

* Monitoring wells near former cold dump.

TABLE E-7
1987 WATER QUALITY PARAMETERS FOR
LOW-LEVEL RADIOACTIVE WASTE LAGOON SYSTEM
GROUNDWATER MONITORING UNIT

LOCATION CODE	QUARTER SAMPLED	pH	CONDUCTIVITY (@25 °C) (µmhos/cm)	mg/L TOC	PHENOL	CHLORIDE	NITRATE	SULFATE	FLUORIDE
WNW86-06	FIRST	6.74	1982	10	0.01	639.1	0.34	49.65	<0.20
WNW86-06	SECOND	6.85	1611	2	<0.01	419.7	<0.10	49.79	<0.20
WNW86-06	THIRD	6.72	1600	1	<0.01	212.4	<0.10	38.00	<0.10
WNW86-06	FOURTH	6.52	1292	1	<0.01	350.3	<0.10	29.25	<0.20
WNGSEEP	FIRST	6.61	402	6	0.01	25.0	4.74	43.58	0.29
WNGSEEP	SECOND	6.49	496	< 1	<0.01	40.5	2.52	55.40	0.10
WNGSEEP	THIRD	6.53	479	< 1	<0.01	36.0	3.73	46.67	<0.10
WNGSEEP	FOURTH	6.04	446	1	<0.01	27.7	6.04	43.00	<0.20
WNSP008	FIRST	7.09	680	11	<0.01	39.6	5.74	60.87	0.04
WNSP008	SECOND	6.70	877	7	<0.02	72.9	6.08	62.33	0.32
WNSP008	THIRD	6.91	895	1	<0.01	81.0	5.44	75.05	0.20
WNSP008	FOURTH	6.65	875	3	<0.01	62.5	6.73	94.60	<0.20
WNW80-05	FIRST	6.92	423	14	0.03	30.6	1.96	28.34	0.37
WNW80-05	SECOND	6.73	650	1	<0.01	58.5	2.67	51.61	<0.20
WNW80-05	THIRD	7.14	546	< 1	<0.01	41.5	0.27	45.79	0.16
WNW80-05	FOURTH	6.98	477	4	<0.01	25.8	0.90	37.31	0.38
WNW80-06	FIRST	6.45	633	16	<0.01	165.7	<0.10	44.51	<0.20
WNW80-06	SECOND	5.96	721	1	<0.01	31.7	1.41	126.66	0.37
WNW80-06	THIRD	6.39	894	1	<0.01	52.0	1.04	164.98	0.17
WNW80-06	FOURTH	6.27	813	1	<0.01	33.4	0.43	153.83	<0.20
WNW86-03	FIRST	7.35	724	16	0.03	74.1	5.95	36.09	0.26
WNW86-03	SECOND	7.42	717	2	<0.01	68.1	4.93	34.00	0.16
WNW86-03	THIRD	7.36	779	< 1	<0.01	90.3	9.60	32.15	0.10
WNW86-03	FOURTH	7.22	823	1	<0.01	129.3	5.35	33.34	<0.20
WNW86-04	FIRST	7.23	706	11	0.01	75.4	5.48	39.97	0.10
WNW86-04	SECOND	7.31	726	3	<0.01	76.9	3.12	35.78	0.26
WNW86-04	THIRD	7.37	774	1	<0.01	82.7	7.28	33.81	0.14
WNW86-04	FOURTH	7.08	807	1	<0.01	97.6	3.90	30.18	<0.20
WNW86-05	FIRST	6.83	436	17	<0.01	2.5	<0.10	41.13	<0.20
WNW86-05	SECOND	6.66	949	34	<0.01	36.2	<1.00	59.59	0.64
WNW86-05	THIRD	6.63	793	12	<0.01	12.5	<0.10	45.70	0.09
WNW86-05	FOURTH	6.93	464	9	<0.01	2.8	<0.10	24.72	0.19

Note: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

TABLE E-8
1987 TOTAL METALS FOR
LOW-LEVEL RADIOACTIVE WASTE LAGOON SYSTEM
GROUNDWATER MONITORING UNIT
(mg/L)

LOCATION CODE	QUARTER SAMPLED	ARSENIC	BARIUM	CADMIUM	CHROMIUM	IRON	LEAD	MANGANESE	MERCURY	SELENIUM	SILVER	SODIUM
WNW86-06	FIRST	<0.010	0.096	0.007	0.009	2.57	0.055	2.34	0.0092	<0.003	0.004	215
WNW86-06	SECOND	<0.005	0.085	0.005	0.009	0.44	<0.005	2.00	<0.0005	<0.005	<0.005	198
WNW86-06	THIRD	0.007	0.085	0.006	0.061	1.50	0.005	3.00	<0.0005	<0.005	<0.005	181
WNW86-06	FOURTH	<0.005	0.060	<0.005	0.005	0.27	0.018	2.90	<0.0005	<0.005	<0.005	118
WNGSEEP	FIRST	0.008	0.132	0.002	0.014	1.85	0.110	0.04	0.0048	<0.001	<0.001	9
WNGSEEP	SECOND	<0.005	0.138	<0.005	<0.007	2.13	<0.005	0.05	<0.0005	<0.005	<0.005	10
WNGSEEP	THIRD	<0.005	0.113	<0.155	0.009	0.13	<0.005	<0.01	<0.0005	<0.005	<0.005	13
WNGSEEP	FOURTH	<0.005	0.075	<0.007	<0.005	0.12	<0.040	0.01	<0.0005	<0.005	<0.005	11
WNSP008	FIRST	<0.010	0.060	0.002	0.010	0.09	0.078	1.21	<0.0100	<0.010	0.002	32
WNSP008	SECOND	<0.005	0.070	<0.005	<0.007	0.08	0.007	1.98	<0.0005	<0.005	<0.005	60
WNSP008	THIRD	<0.005	0.080	<0.006	0.001	0.04	<0.005	1.45	<0.0005	<0.005	<0.005	51
WNSP008	FOURTH	<0.005	0.085	0.005	<0.005	0.05	<0.020	1.93	<0.0005	<0.005	<0.005	42
WNW80-05	FIRST	0.010	0.119	0.000	0.020	15.96	0.085	0.22	0.0115	<0.001	<0.001	3
WNW80-05	SECOND	<0.005	0.130	<0.005	<0.005	15.50	0.021	0.31	<0.0005	<0.005	<0.005	9
WNW80-05	THIRD	<0.005	0.095	<0.008	<0.005	0.95	0.006	0.17	<0.0005	<0.005	<0.005	7
WNW80-05	FOURTH	<0.005	0.058	<0.005	<0.005	1.07	0.002	0.07	0.0004	<0.005	<0.005	6
WNW80-06	FIRST	<0.010	0.098	<0.010	0.043	8.75	0.063	0.15	<0.0100	<0.010	<0.010	6
WNW80-06	SECOND	<0.005	0.055	<0.005	<0.005	0.18	0.005	5.53	<0.0005	<0.005	<0.005	10
WNW80-06	THIRD	<0.005	0.039	<0.008	0.005	0.63	<0.005	7.90	<0.0005	<0.005	<0.005	16
WNW80-06	FOURTH	<0.005	0.063	<0.005	<0.005	0.86	<0.020	9.93	<0.0005	<0.005	<0.005	16
WNW86-03	FIRST	0.010	0.109	<0.010	<0.010	0.50	0.020	0.01	<0.0125	0.015	<0.010	17
WNW86-03	SECOND	<0.005	0.208	<0.005	0.005	0.11	0.005	<0.02	<0.0005	<0.005	<0.005	20
WNW86-03	THIRD	<0.005	0.213	<0.008	<0.005	0.05	0.022	0.01	<0.0005	<0.005	<0.005	22
WNW86-03	FOURTH	<0.005	0.190	<0.005	<0.005	0.04	<0.020	0.01	<0.0005	<0.005	<0.005	21
WNW86-04	FIRST	<0.010	0.195	<0.010	<0.010	5.47	0.022	0.09	0.0226	<0.010	<0.010	20
WNW86-04	SECOND	<0.005	0.285	<0.005	0.005	1.75	0.005	0.05	<0.0005	<0.005	<0.005	20
WNW86-04	THIRD	<0.005	0.215	<0.008	<0.005	0.13	0.005	0.04	<0.0005	<0.005	<0.005	22
WNW86-04	FOURTH	<0.005	0.290	<0.005	<0.005	3.08	<0.040	0.09	<0.0005	<0.005	<0.005	22
WNW86-05	FIRST	<0.010	0.113	<0.010	<0.010	0.81	0.020	2.63	<0.0100	<0.010	<0.010	18
WNW86-05	SECOND	<0.200	0.135	<0.005	<0.010	3.78	<0.100	12.50	<0.0005	<0.200	<0.020	64
WNW86-05	THIRD	<0.010	0.108	<0.002	<0.020	3.78	<0.050	10.85	0.0003	<0.005	<0.010	38
WNW86-05	FOURTH	<0.010	0.063	<0.002	0.067	2.16	<0.050	6.29	<0.0002	<0.050	0.053	16

Note: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

TABLE E-9
1987 DISSOLVED METALS FOR
LOW-LEVEL RADIOACTIVE WASTE LAGOON SYSTEM
GROUNDWATER MONITORING UNIT
(mg/L)

LOCATION CODE	QUARTER SAMPLED	ARSENIC	BARIUM	CADMIUM	CHROMIUM	IRON	LEAD	MANGANESE	MERCURY	SELENIUM	SILVER	SODIUM
WNW86-06	FIRST	<0.001	0.08	<0.001	0.002	0.05	0.000	2.19	<0.0010	0.007	<0.001	188
WNW86-06	SECOND	<0.005	0.09	<0.005	<0.006	0.01	<0.005	2.00	<0.0005	<0.005	<0.005	195
WNW86-06	THIRD	<0.005	0.08	<0.005	<0.005	<0.05	<0.005	3.00	<0.0005	<0.005	<0.005	164
WNW86-06	FOURTH	<0.005	0.06	<0.005	<0.005	0.02	<0.020	2.68	<0.0005	<0.005	<0.005	100
WNGSEEP	FIRST	<0.010	0.08	<0.010	<0.010	0.04	0.010	<0.01	<0.0100	0.010	<0.010	9
WNGSEEP	SECOND	<0.005	0.11	<0.005	<0.005	<0.02	<0.05	<0.01	<0.0005	<0.005	<0.005	10
WNGSEEP	THIRD	<0.005	0.12	<0.005	<0.005	<0.03	<0.005	<0.01	<0.0005	<0.005	<0.005	12
WNGSEEP	FOURTH	<0.005	0.08	<0.005	<0.005	<0.02	<0.030	0.01	<0.0005	<0.005	<0.005	12
WNSP008	FIRST	<0.010	0.05	<0.010	<0.010	0.04	0.010	1.02	<0.0100	0.010	0.018	28
WNSP008	SECOND	<0.005	0.07	<0.005	<0.005	<0.02	<0.005	1.85	<0.0005	<0.005	<0.005	60
WNSP008	THIRD	<0.005	0.07	<0.005	<0.005	<0.03	<0.005	1.80	<0.0005	<0.009	<0.005	52
WNSP008	FOURTH	<0.005	0.08	<0.005	<0.005	0.03	0.023	1.85	<0.0005	<0.005	<0.005	42
WNW80-05	FIRST	<0.001	0.05	0.001	0.005	0.31	0.008	2.12	0.0010	0.005	0.001	12
WNW80-05	SECOND	<0.005	0.07	<0.005	<0.005	<0.02	<0.005	0.08	<0.0005	<0.005	<0.005	9
WNW80-05	THIRD	<0.005	0.09	<0.005	0.004	0.19	<0.005	0.18	<0.0005	<0.005	<0.005	7
WNW80-05	FOURTH	<0.005	0.06	<0.005	<0.005	0.43	<0.020	0.07	<0.0005	<0.005	<0.005	6
WNW80-06	FIRST	<0.003	0.05	<0.003	0.006	0.30	0.006	6.44	0.0049	0.010	<0.003	12
WNW80-06	SECOND	<0.005	0.02	<0.005	<0.005	0.03	<0.005	5.43	<0.0005	<0.005	<0.005	10
WNW80-06	THIRD	<0.005	0.06	<0.005	<0.005	0.18	<0.005	4.15	<0.0005	<0.005	<0.005	32
WNW80-06	FOURTH	<0.005	0.07	<0.005	<0.005	0.75	0.020	11.00	<0.0005	<0.005	<0.005	14
WNW86-03	FIRST	<0.001	0.13	<0.001	0.002	0.03	0.010	0.01	0.0010	<0.005	0.001	17
WNW86-03	SECOND	<0.005	0.19	<0.005	<0.006	<0 02	<0.005	<0.02	<0.0008	<0.005	<0.005	20
WNW86-03	THIRD	<0.005	0.23	<0.005	0.005	<0.05	<0.005	<0.01	<0.0005	<0.005	<0.005	21
WNW86-03	FOURTH	<0.005	0.21	<0.005	<0.005	<0.02	0.018	<0.01	<0.0005	<0.005	<0.005	22
WNW86-04	FIRST	0.001	0.21	<0.001	<0.001	0.08	0.001	0.05	0.0010	0.013	0.001	17
WNW86-04	SECOND	<0.005	0.24	<0.005	<0.006	0.03	<0.005	0.04	<0.0008	<0.005	<0.005	20
WNW86-04	THIRD	<0.005	0.19	<0.005	<0.005	<0.05	<0.005	0.04	<0.0005	<0.005	<0.005	21
WNW86-04	FOURTH	<0.005	0.23	<0.005	<0.005	0.05	0.030	0.04	<0.0005	<0.005	<0.005	22
WNW86-05	FIRST	0.003	0.05	<0.001	0.006	0.29	0.012	2.13	0.0010	0.003	0.001	12
WNW86-05	SECOND	<0.200	0.12	<0.005	<0.010	1.18	<0.100	11.50	<0.0005	<0.200	<0.020	59
WNW86-05	THIRD	<0.010	0.12	<0.002	<0.020	3.43	<0.050	10.48	0.0003	<0.005	<0.010	36
WNW86-05	FOURTH	<0.010	0.07	<0.002	0.046	1.77	0.050	5.88	0.0002	<0.050	0.089	15

Note: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

TABLE E-10

1987 RADIOACTIVITY CONCENTRATIONS FOR GROUNDWATER IN THE LOW-LEVEL RADIOACTIVE WASTE LAGOON SYSTEM

(μCi/mL)

LOCATION CODE	QUARTER SAMPLED	ALPHA	BETA	Tritium (H-3)	Cs-137	Co-60
WNW86-06	FIRST	<5.30E-09	7.02E-09 ± 1.39E-09	6.30E-08 ± 5.41E-08	7.77E-08 +/-5.27E-08	<1.09E-07
WNW86-06	SECOND	<1.76E-09	9.53E-09 ± 9.68E-10	5.68E-08 ± 5.27E-08	<1.08E-07	<1.09E-07
WNW86-06	THIRD	<3.57E-09	4.81E-09 ± 9.64E-10	<1.00E-07	<1.08E-07	<1.09E-07
WNW86-06	FOURTH	<2.48E-09	4.17E-09 ± 1.08E-09	<1.00E-07	<1.08E-07	<1.09E-07
WNGSEEP	FIRST	<2.44E-09	2.70E-09 ± 9.43E-10	1.18E-06 ± 7.72E-08	<5.72E-08	<1.09E-07
WNGSEEP	SECOND	<1.08E-09	2.95E-09 ± 5.86E-10	1.48E-06 ± 7.13E-08	<1.08E-07	<1.09E-07
WNGSEEP	THIRD	<1.17E-09	3.31E-09 ± 6.23E-10	1.28E-06 ± 7.38E-08	<1.08E-07	<1.09E-07
WNGSEEP	FOURTH	<1.29E-09	3.24E-09 ± 9.01E-10	5.80 E-06 ± 2.60E-07	<1.08E-07	<1.09E-07
WNSP008	FIRST	<2.50E-09	3.22E-08 ± 1.89E-09	5.63E-06 ± 1.48E-07	<1.08E-07	<1.09E-07
WNSP008	SECOND	1.26E-09 ± 8.68E-10	2.35E-08 ± 1.19E-09	8.50E-06 ± 1.66E-07	<1.08E-07	<1.09E-07
WNSP008	THIRD	<2.08E-09 ± 0.00E+00	2.99E-08 ± 1.43E-09	7.47E-06 ± 1.58E-07	5.49E-08 ± 4.96E-08	<1.09E-07
WNSP008	FOURTH	<1.82E-09	3.72E-08 ± 1.94E-09	9.31E-06 ±3.60E-07	<1.08E-07	<1.09E-07
WNW80-05	FIRST	<1.12E-09	<1.77E-09	<5.77E-08	<1.08E-07	<1.09E-07
WNW80-05	SECOND	4.67E-09 ± 1.82E-09	9.14E-09 ± 8.90E-10	7.42E-07 ± 6.56E-08	<1.08E-07	<1.09E-07
WNW80-05	THIRD	<1.29E-09	1.16E-08 ± 1.20E-09	5.09E-07 ± 5.91E-08	<1.08E-07	<1.09E-07
WNW80-05	FOURTH	<1.28E-09	1.56E-09 ± 7.70E-10	4.92E-07 ± 8.74E-08	<1.08E-07	<1.09E-07
WNW80-06	FIRST	7.77E-09 ± 3.37E-09	1.79E-08 ± 1.65E-09	1.55E-06 ± 8.13E-08	<1.08E-07	<1.09E-07
WNW80-06	SECOND	<1.79E-09	7.06E-09 ± 7.95E-10	2.05E-06 ± 7.88E-08	<1.08E-07	<1.09E-07
WNW80-06	THIRD	<1.91E-09	4.49E-09 ± 8.81E-10	1.66E-06 ± 8.51E-08	<1.08E-07	<1.09E-07
WNW80-06	FOURTH	<1.90E-09	2.14E-09 ± 8.12E-10	1.30E-07 ± 1.11E-07	<1.08E-07	<1.09E-07
WNW86-03	FIRST	<2.78E-09	8.42E-09 ± 1.23E-09	1.28E-06 ± 7.00E-08	<1.08E-07	<1.09E-07
WNW86-03	SECOND	1.24E-09 ± 9.37E-10	1.00E-08 ± 8.68E-10	1.61E-06 ± 7.13E-08	<1.08E-07	<1.09E-07
WNW86-03	THIRD	<1.47E-09	5.05E-09 ± 8.24E-10	1.88E-06 ± 7.51E-08	5.90E-08 ± 5.45E-08	<1.09E-07
WNW86-03	FOURTH	<2.06E-09	8.31E-09 ± 1.08E-09	1.39E-06 ± 7.01E-08	<1.08E-07	<1.09E-07
WNW86-04	FIRST	<2.15E-09	1.14E-08 ± 1.36E-09	1.68E-06 ± 7.63E-08	<1.08E-07	<1.09E-07
WNW86-04	SECOND	2.32E-09 ± 1.14E-09	8.46E-09 ± 8.24E-10	1.66E-06 ± 7.50E-08	<1.08E-07	<1.09E-07
WNW86-04	THIRD	<1.79E-09	3.85E-08 ± 1.50E-09	2.06E-06 ± 7.63E-08	<1.08E-07	<1.09E-07
WNW86-04	FOURTH	<2.09E-09	1.90E-08 ± 1.47E-09	1.60E-06 ± 1.50E-07	<1.08E-07	<1.09E-07
WNW86-05	FIRST	8.60E-09 ± 2.98E-09	1.06E-05 ± 5.00E-08	8.94E-06 ± 1.81E-07	<1.08E-07	<1.09E-07
WNW86-05	SECOND	1.82E-08 ± 2.86E-09	3.14E-05 ± 5.00E-08	3.31E-05 ± 5.26E-07	<1.08E-07	<1.09E-07
WNW86-05	THIRD	4.84E-09 ± 2.01E-09	2.67E-05 ± 5.00E-08	1.82E-05 ± 3.26E-07	<1.08E-07	<1.09E-07
WNW86-05	FOURTH	<2.69E-09	1.61E-05 ± 5.00E-08	8.67E-06 ± 3.60E-07	<1.08E-07	<1.09E-07

Notes: Data represent average of four replicate measurements per quarter.

*In one replicate measurement from well WNW86-05, Fourth Quarter, Sr-90 = 7.75 E-06 ± 0.1E-06.

TABLE E-11
1987 WATER QUALITY PARAMETERS FOR
NRC-LICENSED DISPOSAL AREA
GROUNDWATER MONITORING UNIT

LOCATION CODE	QUARTER SAMPLED	pH	CONDUCTIVITY (@25 °C) (μmhos/cm)	mg/L TOC	PHENOL	CHLORIDE	NITRATE	SULFATE	FLUORIDE
WNW83-2D*	FIRST	11.69	631	180	0.12	19.40	<0.10	10.00	0.57
WNW83-1D	SECOND	7.73	304	29	<0.01	6.47	0.28	3.07	0.40
WNW83-1D	THIRD	7.70	296	11	<0.01	6.69	<0.10	1.11	0.78
WNW83-1D	FOURTH	7.61	296	3	<0.01	7.73	0.28	0.10	0.64
WNW86-10	FIRST	8.46	521	16	<0.01	1.14	<0.10	56.60	0.01
WNW86-10	SECOND	8.81	528	5	<0.01	0.49	0.94	30.96	0.13
WNW86-10	THIRD	8.29	352	2	<0.01	0.83	0.31	42.65	0.13
WNW86-10	FOURTH	7.84	585	< 1	<0.01	0.52	0.53	56.81	<0.20
WNW86-11	FIRST	9.32	478	14	0.01	0.47	<0.10	15.34	0.39
WNW86-11	SECOND	7.35	643	14	0.01	1.21	1.38	67.44	0.04
WNW86-11	THIRD	7.55	681	8	<0.01	1.21	0.37	84.78	0.10
WNW86-11	FOURTH	7.51	646	1	<0.01	1.32	0.33	147.84	<0.20

Notes: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

* Well WNW83-2D removed from service due to very low yield.

TABLE E-12
1987 TOTAL METALS FOR
NRC-LICENSED DISPOSAL AREA
GROUNDWATER MONITORING UNIT
(mg/L)

LOCATION CODE	QUARTER SAMPLED	ARSENIC	BARIUM	CADMIUM	CHROMIUM	IRON	LEAD	MANGANESE	MERCURY	SELENIUM	SILVER	SODIUM
WNW83-2D*	FIRST	0.270	1.50	0.030	0.640	317.70	2.890	3.96	< 0.0100	< 0.010	< 0.010	40
WNW83-1D	SECOND	< 0.005	0.49	< 0.005	0.009	14.65	0.016	0.21	< 0.0005	< 0.005	< 0.005	40
WNW83-1D	THIRD	0.005	0.50	< 0.008	0.007	17.00	0.030	0.28	< 0.0006	< 0.005	< 0.005	33
WNW83-1D	FOURTH	< 0.005	0.52	< 0.007	< 0.005	4.40	< 0.040	0.15	< 0.0005	< 0.010	< 0.005	25
WNW86-10	FIRST	< 0.010	0.07	< 0.010	0.010	5.03	0.100	0.43	< 0.0100	< 0.010	< 0.010	3
WNW86-10	SECOND	0.005	0.12	< 0.005	0.088	10.03	0.013	0.20	< 0.0006	< 0.005	< 0.005	80
WNW86-10	THIRD	0.006	0.14	< 0.006	0.005	0.80	< 0.005	0.05	< 0.0005	< 0.005	< 0.005	68
WNW86-10	FOURTH	0.010	0.16	< 0.007	0.006	0.55	0.040	0.05	< 0.0005	< 0.005	< 0.005	67
WNW86-11	FIRST	< 0.010	0.90	< 0.010	0.313	91.07	1.048	1.74	< 0.0100	< 0.010	< 0.010	77
WNW86-11	SECOND	0.007	0.19	< 0.005	0.070	26.50	0.037	0.54	< 0.0005	< 0.005	< 0.005	60
WNW86-11	THIRD	0.131	0.53	< 0.008	0.317	118.25	0.211	4.74	< 0.0005	< 0.005	0.005	60
WNW86-11	FOURTH	0.006	0.10	< 0.007	0.029	4.83	0.013	0.26	< 0.0005	< 0.005	< 0.005	56

Note: Each entry represents the average of four replicate measurements. Averages were obtained using Cohen's method from "RCRA Ground-water Monitoring Technical Enforcement Document."

* Well WNW83-2D removed from service due to very low yield.

TABLE E-13
1987 DISSOLVED METALS FOR
NRC-LICENSED DISPOSAL AREA
GROUNDWATER MONITORING UNIT
(mg/L)

LOCATION CODE	QUARTER SAMPLED	ARSENIC	BARIUM	CADMIUM	CHROMIUM	IRON	LEAD	MANGANESE	MERCURY	SELENIUM	SILVER	SODIUM
WNW83-2D*	FIRST	< 0.010	0.06	< 0.010	< 0.010	0.04	0.010	0.02	< 0.0100	< 0.010	< 0.010	25
WNW83-1D	SECOND	< 0.005	0.43	< 0.005	< 0.005	< 0.04	< 0.005	0.10	< 0.0005	< 0.005	< 0.005	40
WNW83-1D	THIRD	< 0.005	0.47	< 0.005	< 0.005	0.18	< 0.005	0.18	< 0.0006	< 0.005	< 0.005	31
WNW83-1D	FOURTH	< 0.005	0.50	< 0.005	< 0.005	0.09	< 0.030	0.10	< 0.0005	< 0.005	< 0.005	28
WNW86-10	FIRST	< 0.010	0.10	< 0.010	0.010	0.62	0.018	0.07	< 0.0100	0.010	0.025	50
WNW86-10	SECOND	< 0.005	0.07	< 0.005	0.005	< 0.04	< 0.005	0.01	< 0.0005	< 0.005	< 0.005	80
WNW86-10	THIRD	0.007	0.14	< 0.005	< 0.005	0.14	< 0.005	0.04	< 0.0005	< 0.005	< 0.005	66
WNW86-10	FOURTH	0.009	0.17	< 0.005	< 0.005	0.41	< 0.030	0.06	< 0.0005	< 0.005	< 0.005	66
WNW86-11	FIRST	< 0.010	0.07	< 0.010	< 0.010	0.01	0.010	0.01	< 0.0100	0.010	< 0.010	74
WNW86-11	SECOND	< 0.005	0.11	< 0.005	< 0.005	0.02	< 0.005	0.11	< 0.0005	< 0.005	< 0.005	60
WNW86-11	THIRD	< 0.005	0.12	< 0.005	< 0.005	< 0.05	< 0.005	0.30	< 0.0005	< 0.005	< 0.005	59
WNW86-11	FOURTH	< 0.005	0.09	< 0.005	< 0.005	0.01	< 0.030	0.13	< 0.0005	< 0.005	< 0.005	57

Notes: Each entry represents the average of four replicate measurements per quarter. Cohen's method from the "RCRA Ground-water Monitoring Technical Enforcement Guidance Document" was used to average the mixture of positive and less-than-detection-limit values.

* Well WNW83-2D removed from Service due to very low yield.

TABLE E-14

1987 RADIOACTIVITY CONCENTRATIONS FOR GROUNDWATER IN THE NRC-LICENSED DISPOSAL AREA

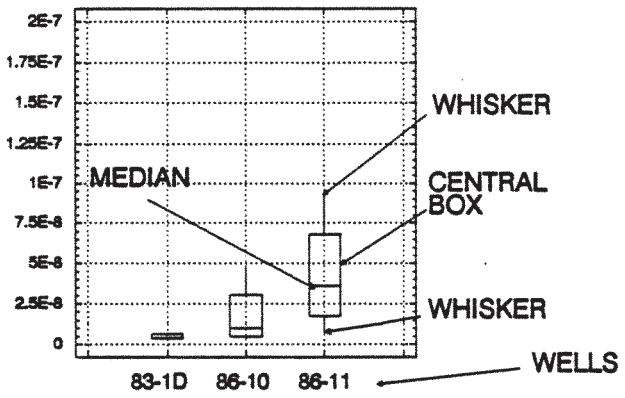
(μCi/mL)

LOCATION CODE	QUARTER SAMPLED	ALPHA	BETA	Tritium (H-3)	Cs-137	Co-60
WNW83-2D*	FIRST	< 1.00E-07	2.84E-07 ± 5.89E-08	3.15E-07 ± 1.55E-08	< 4.20E-08	< 4.80E-08
WNW83-1D	SECOND	< 1.00E-07	2.12E-09 ± 1.09E-09	5.87E-09 ± 7.09E-10	< 8.60E-08	< 8.90E-08
WNW83-1D	THIRD	< 1.00E-07	2.69E-09 ± 1.15E-09	4.00E-09 ± 1.03E-09	< 1.08E-07	< 1.09E-07
WNW83-1D	FOURTH	< 1.00E-07	< 1.56E-09	3.51E-09 ± 8.94E-10	< 8.60E-08	< 8.90E-08
WNW86-10	FIRST	< 1.00E-07	2.10E-08 ± 7.66E-09	4.31E-08 ± 2.66E-09	< 1.08E-07	< 1.09E-07
WNW86-10	SECOND	< 1.00E-07	8.22E-09 ± 2.40E-09	1.37E-08 ± 1.14E-09	< 1.08E-07	< 1.09E-07
WNW86-10	THIRD	< 1.00E-07	< 1.61E-09	6.76E-09 ± 8.60E-10	< 1.08E-07	< 1.09E-07
WNW86-10	FOURTH	< 1.00E-07	< 2.01E-09	4.51E-09 ± 9.95E-10	< 1.08E-07	< 1.09E-07
WNW86-11	FIRST	< 1.00E-07	4.44E-08 ± 1.09E-08	8.80E-08 ± 4.14E-09	< 1.08E-07	< 1.09E-07
WNW86-11	SECOND	< 5.23E-08	1.11E-08 ± 3.97E-09	3.08E-08 ± 1.69E-09	< 1.08E-07	< 1.09E-07
WNW86-11	THIRD	1.31E-07 ± 5.17E-08	1.77E-08 ± 6.59E-09	4.25E-08 ± 2.69E-09	< 1.08E-07	< 1.09E-07
WNW86-11	FOURTH	< 1.00E-07	3.71E-09 ± 2.55E-09	1.21E-08 ± 1.36E-09	< 1.08E-07	< 1.09E-07

Notes: Data represent average of four replicate measurements per quarter.

* Well WNW83-2D removed from service due to very low yield.

Note: Example Box-and-Whisker plot and table are shown for gross beta levels (μCi/L) in samples from NRC-Licensed Disposal Area.



Quarter Sampled	83-1D	86-10	86-11
First	***NOT SAMPLED***	4.32E-08 ± 0.53E-08	8.34E-08 ± 0.80E-08
		4.02E-08 ± 0.52E-08	8.47E-08 ± 0.81E-08
		4.71E-08 ± 0.55E-08	9.32E-08 ± 0.86E-08
		4.20E-08 ± 0.53E-08	9.05E-08 ± 0.84E-08
Second	6.60E-09 ± 1.41E-09	1.38E-08 ± 0.20E-08	3.17E-08 ± 0.33E-08
	6.82E-09 ± 1.36E-09	1.14E-08 ± 0.18E-08	1.91E-08 ± 0..23E-08
	3.64E-09 ± 1.22E-09	8.64E-09 ± 1.58E-09	3.95E-08 ± 0.37E-08
	6.43E-09 ± 1.65E-09	2.11E-08 ± 0.33E-08	3.28E-08 ± 0.40E-08
Third	4.10E-09 ± 1.98E-09	6.41E-09 ± 1.53E-09	5.24E-08 ± 0.57E-08
	5.93E-09 ± 2.27E-09	3.89E-09 ± 1.35E-09	5.20E-08 ± 0.59E-08
	2.33E-09 ± 1.93E-09	4.06E-09 ± 1.38E-09	2.05E-08 ± 0.37E-08
	3.65E-09 ± 2.04E-09	1.27E-08 ± 0.24E-08	4.51E-08 ± 0.59E-08
Fourth	3.45E-09 ± 1.19E-09	4.12E-09 ± 1.36E-09	1.34E-08 ± 0.22E-08
	3.81E-09 ± 1.94E-09	4.82E-09 ± 2.14E-09	1.28E-08 ± 0.29E-08
	3.94E-09 ± 1.99E-09	4.30E-09 ± 2.14E-09	1.54E-08 ± 0.32E-08
	2.86E-09 ± 1.91E-09	4.79E-09 ± 2.20E-09	6.76E-09 ± 2.47E-09
Median	0.39E-08	1.00E-08	3.62E-08

The multiple box-and-whisker plot is used to display data for selected indicator parameters for wells grouped within the same waste management unit. The individual results of four replicate samples collected per quarter per parameter were included as individual values for all periods for which a particular well was sampled during 1987.

The multiple box-and-whisker plot:

- Indicates the median of the data as a horizontal line within the box;
- Indicates the middle 50 percent of the data (between the upper and lower quartiles) by the outline of the central box;
- Indicates the range of data by the extension of the whiskers (extreme values beyond 1.5 times the box length are plotted as individual points);
- May indicate skewed data characteristics by the relative positions of the median line, box outline, and whisker extensions; and
- Allows for immediate visual comparison of all wells within a waste management unit for a given parameter.

In all box-and-whisker plots shown in this appendix, the upgradient well is positioned on the left side of the plot.

Figure E-1. Explanation of Box-and-Whisker Plot used to display well water parameters for groundwater monitoring units.

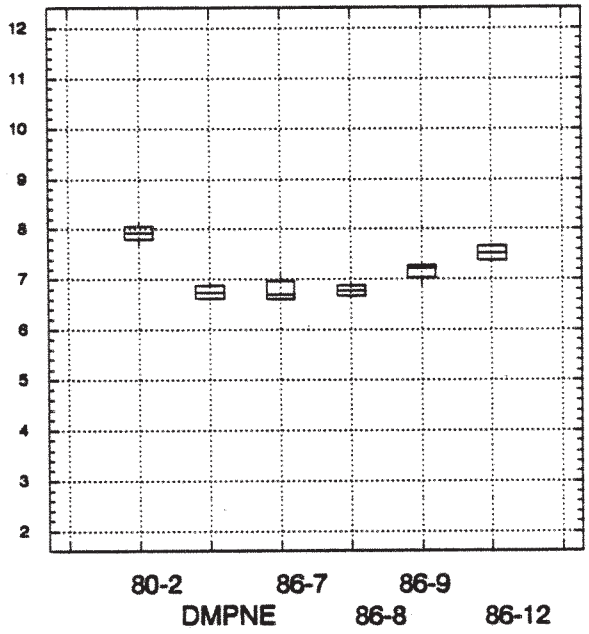


Figure E-2. pH values in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

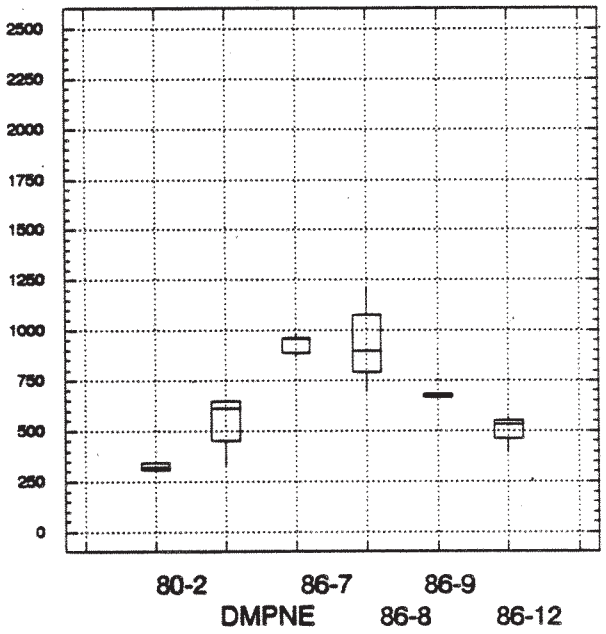


Figure E-3. Conductivity (μmhos/cm at 25 °C) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

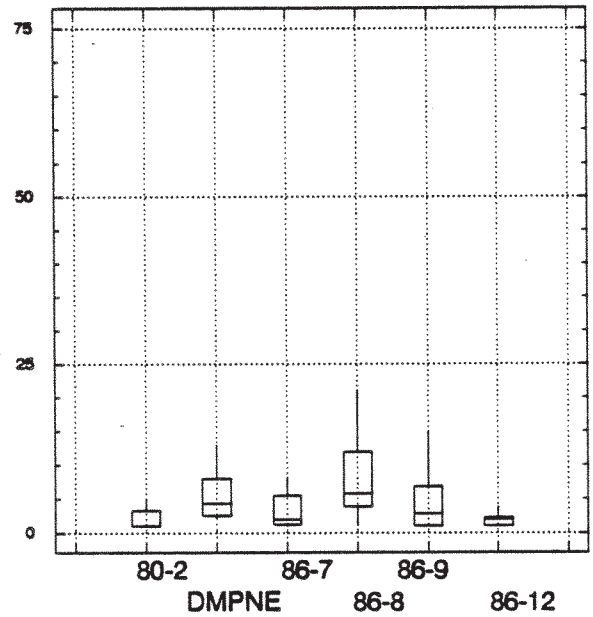


Figure E-4. Total Organic Carbon (mg/L) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

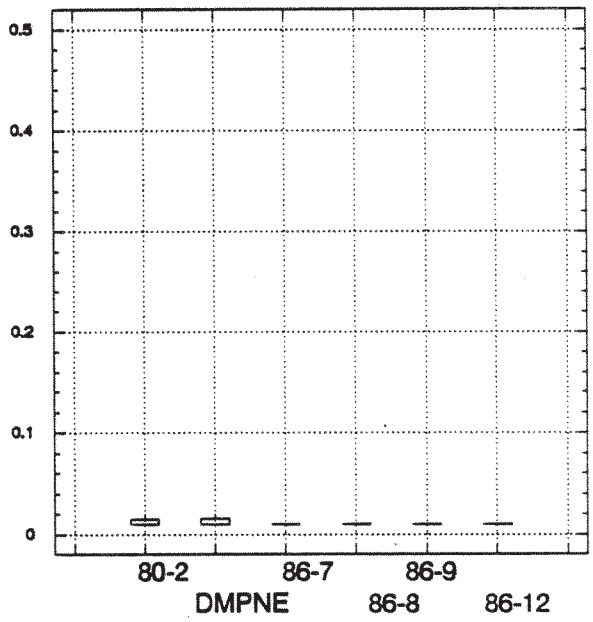


Figure E-5. Phenols (mg/L) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

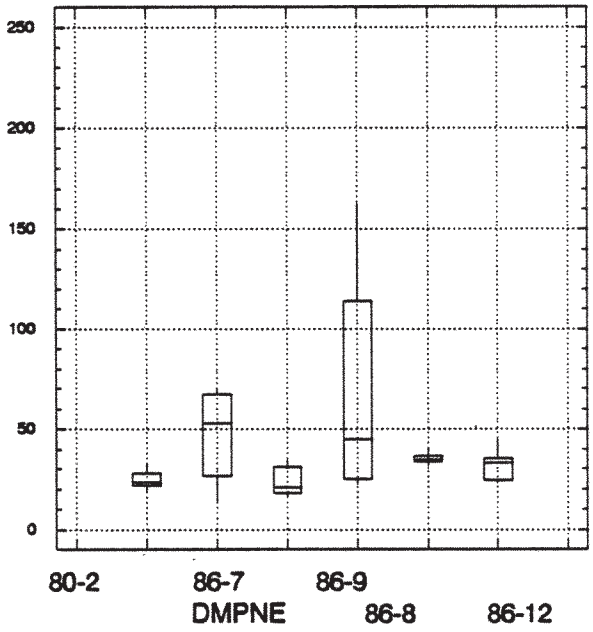


Figure E-6. Chloride (mg/L) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

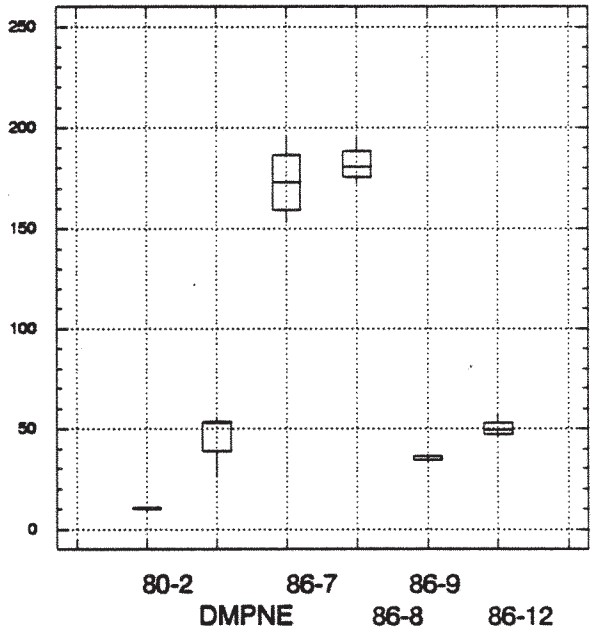


Figure E-7. Sulfate (mg/L) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

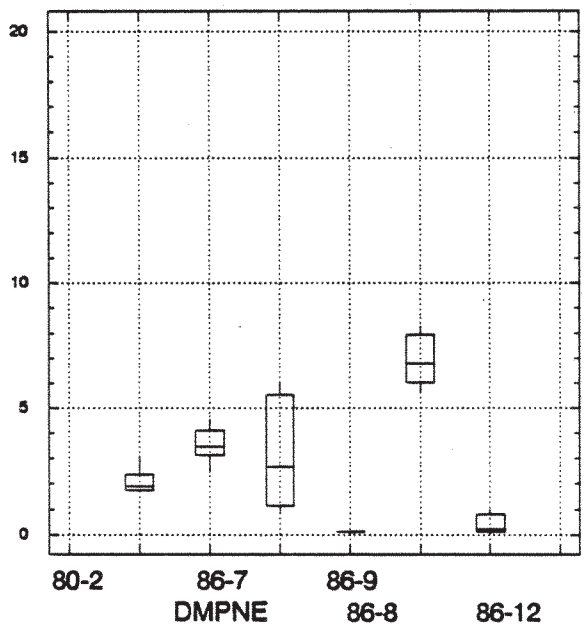


Figure E-8. Nitrate (mg/L) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

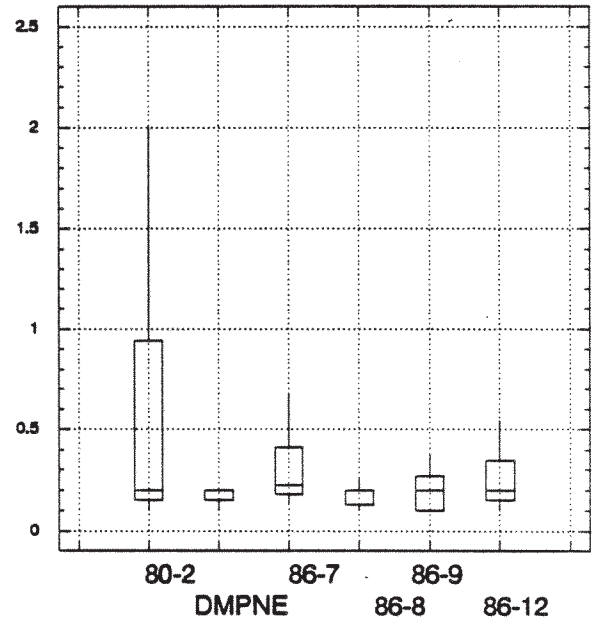


Figure E-9. Fluoride (mg/L) in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

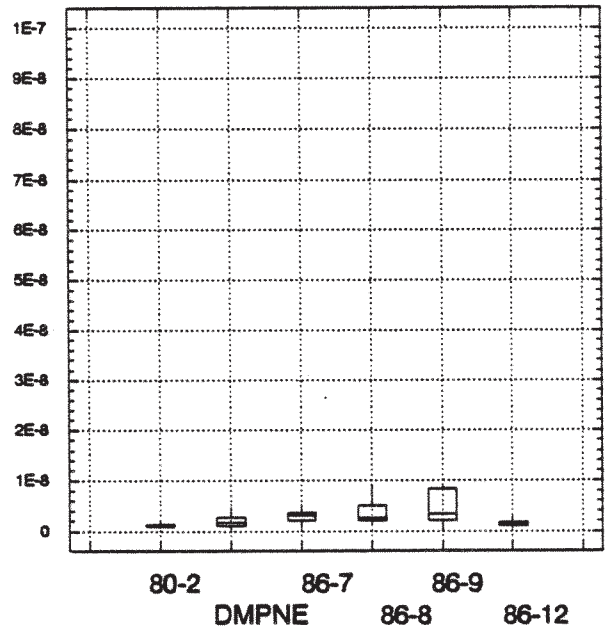


Figure E-10. Gross alpha levels (μCi/mL) for well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit. (1st Quarter Data for 86-9 is missing.)

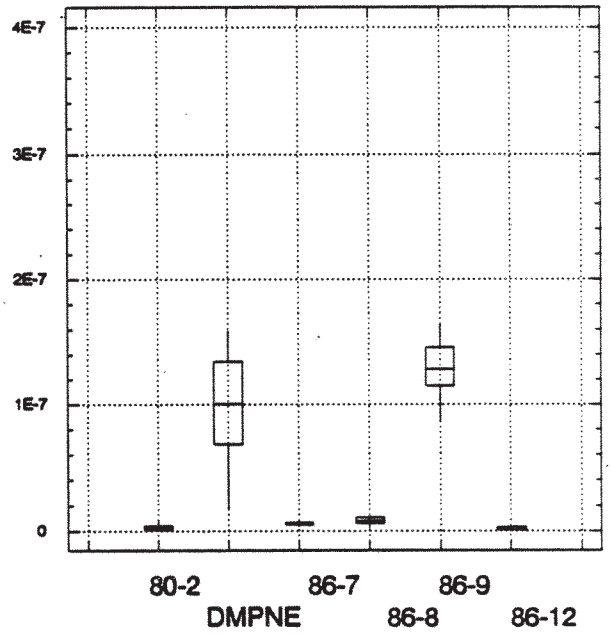


Figure E-11. Gross beta levels (μCi/mL) for well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

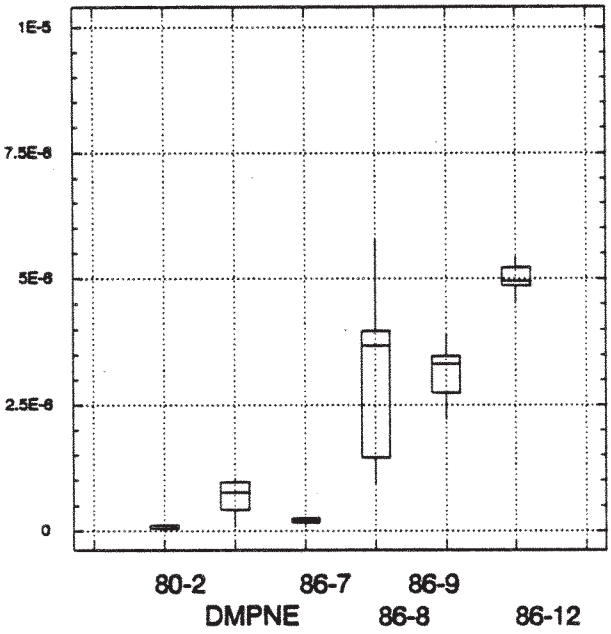


Figure E-12. Tritium (H-3) levels (μCi/mL) for well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

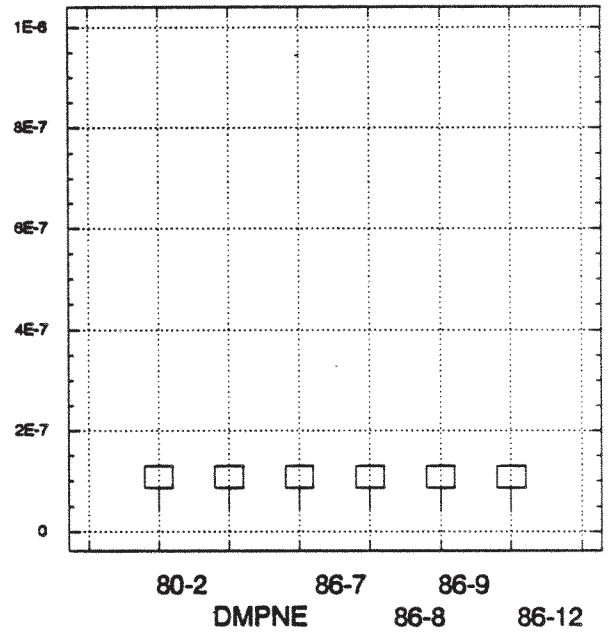


Figure E-13. Cesium-137 levels (μCi/mL) for well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

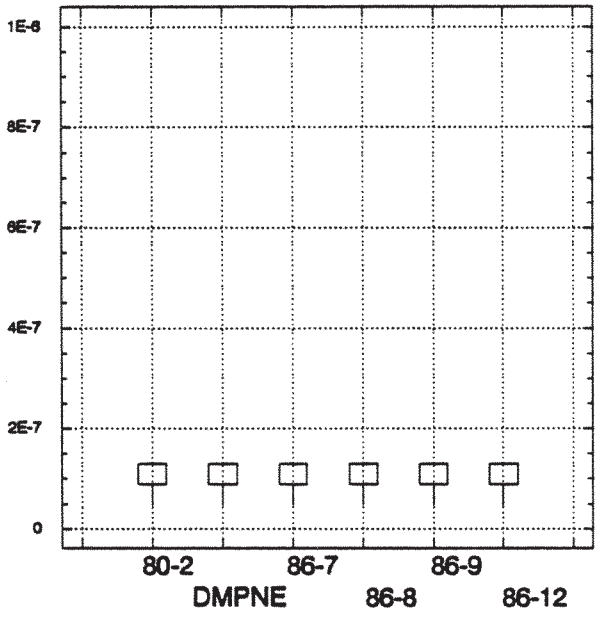


Figure E-14. Cobalt-60 levels (μCl/mL)in well samples from the High-Level Radioactive Waste Tank Complex Groundwater Monitoring Unit.

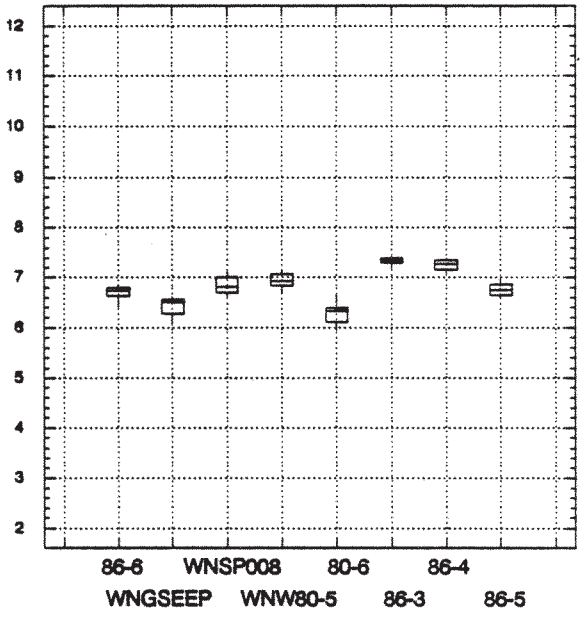


Figure E-15. pH in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

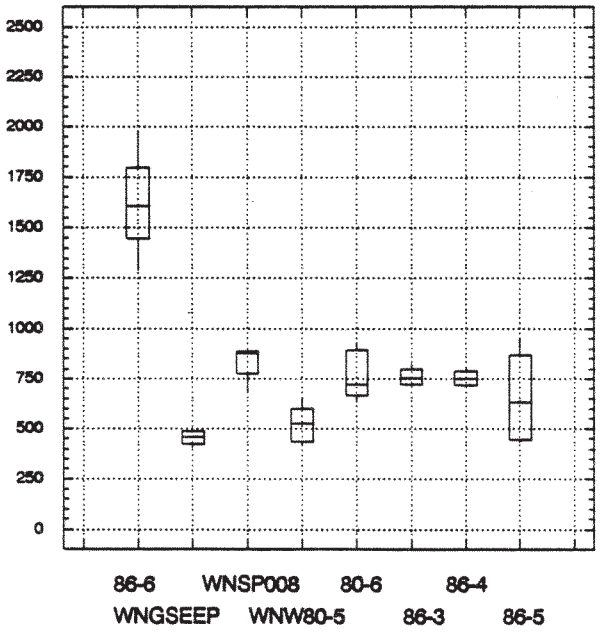


Figure E-16. Conductivity (μmhos at 25 °C) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

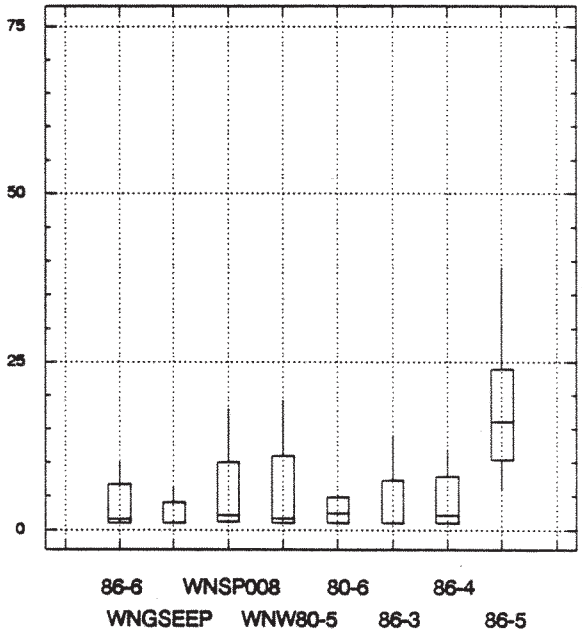


Figure E-17. Total Organic Carbon (mg/L) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

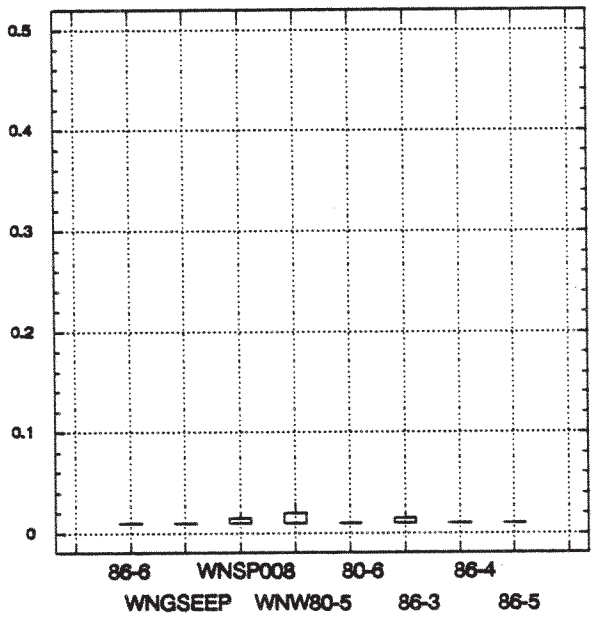


Figure E-18. Phenol levels (mg/L) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

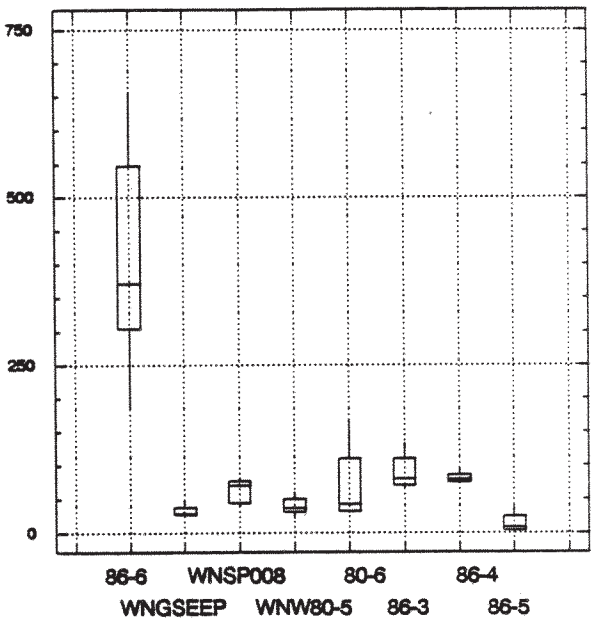


Figure E-19. Chloride (mg/L) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

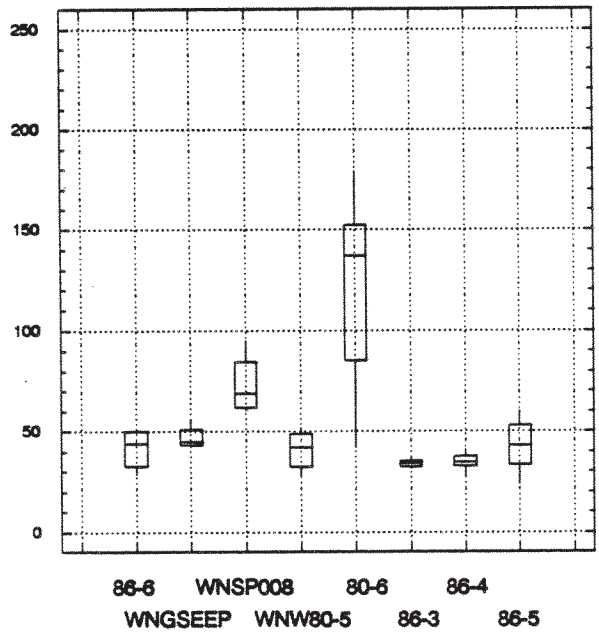


Figure E-20. Sulfate (mg/L) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

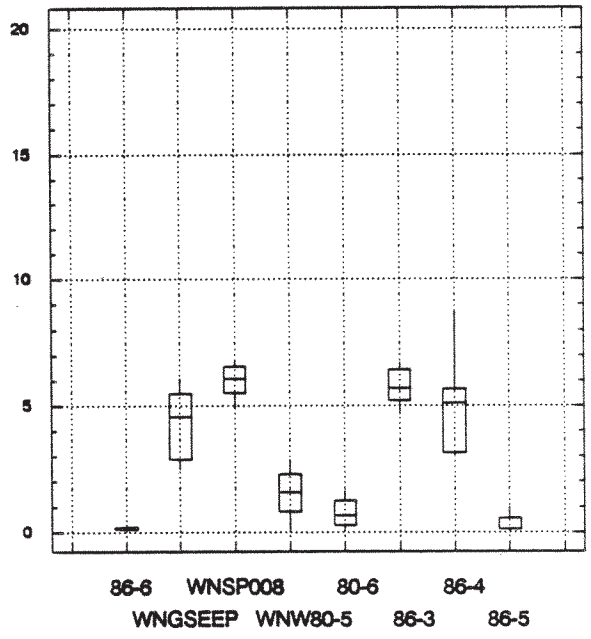


Figure E-21. Nitrate (mg/L) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

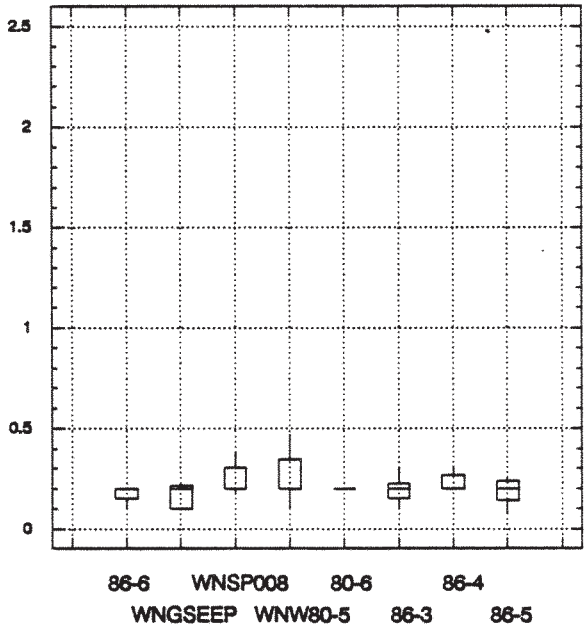


Figure E-22. Fluoride (mg/L) in well samples from Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

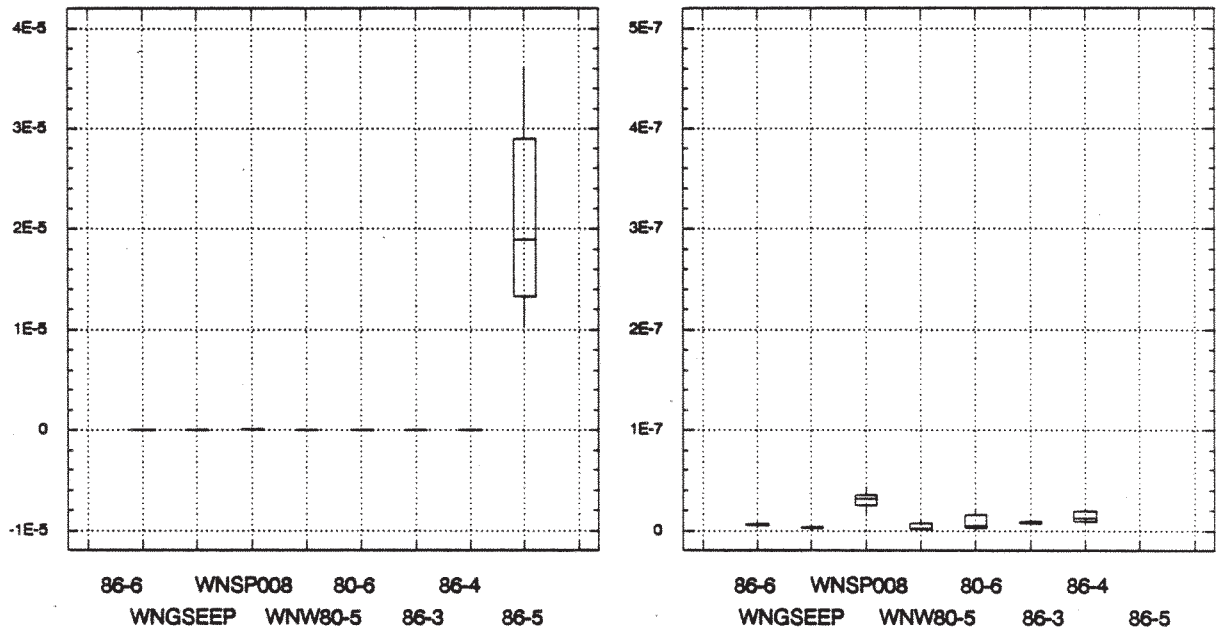


Figure E-23. Gross beta levels (μCi/mL) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit. Two charts are included to account for the off-scale reading at well 86-5.

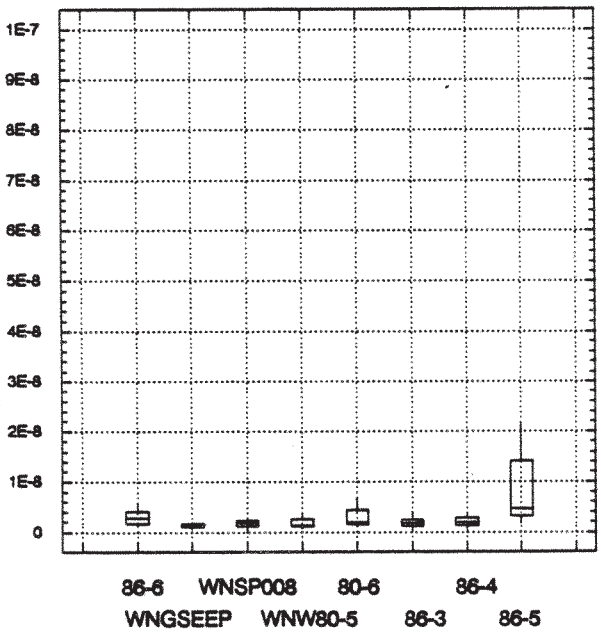


Figure E-24. Gross alpha levels (μCi/mL) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

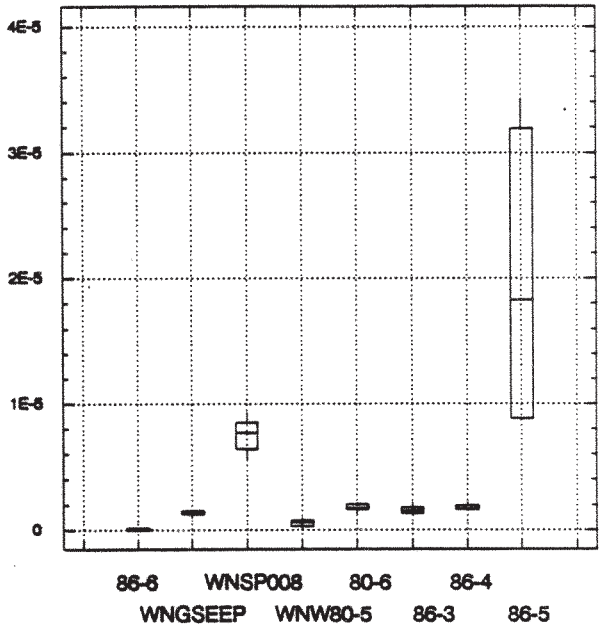


Figure E-25. Tritium (H-3) levels (μCi/mL) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

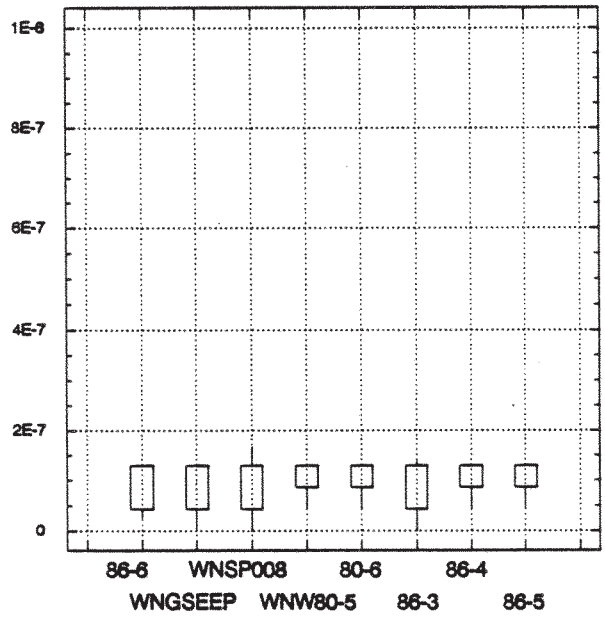


Figure E-26. Cesium-137 levels (μCi/mL) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

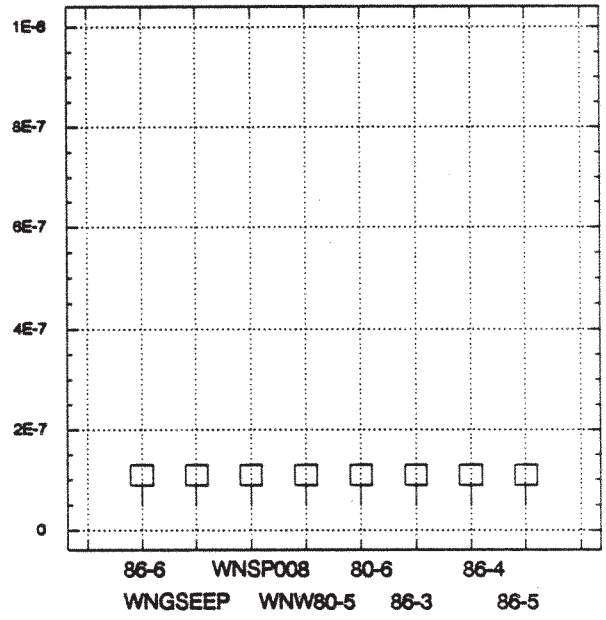


Figure E-27. Cobalt-60 levels (μCi/mL) in well samples from the Low-Level Radioactive Waste Lagoon System Groundwater Monitoring Unit.

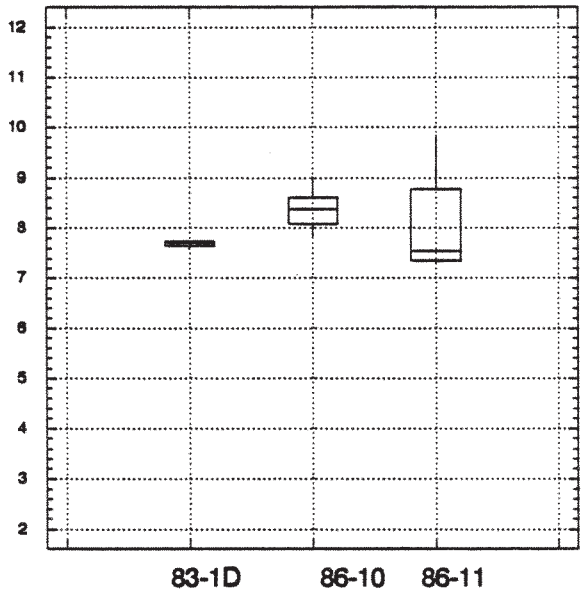


Figure E-28. pH values in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

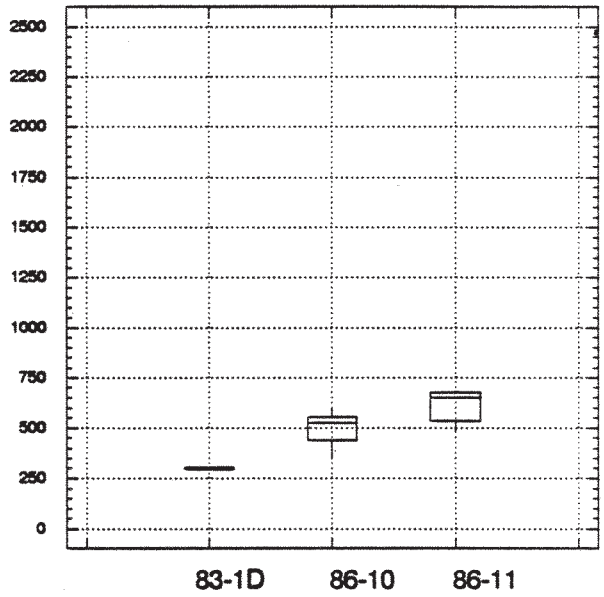


Figure E-29. Conductivity (μmhos/cm at 25 °C) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

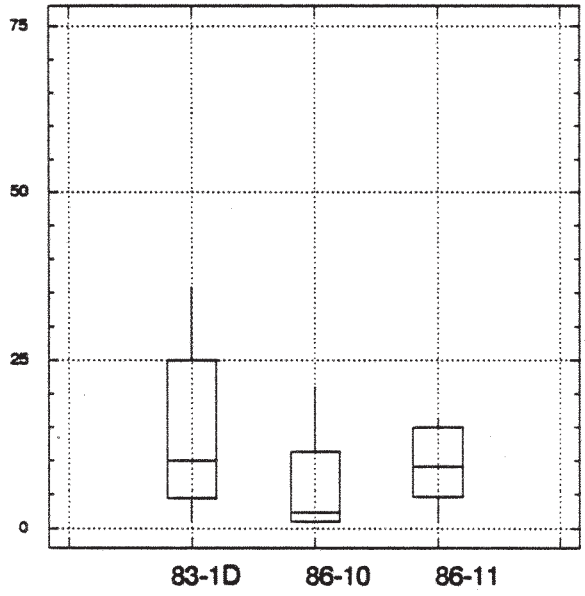


Figure E-30. Total organic carbon (mg/L) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

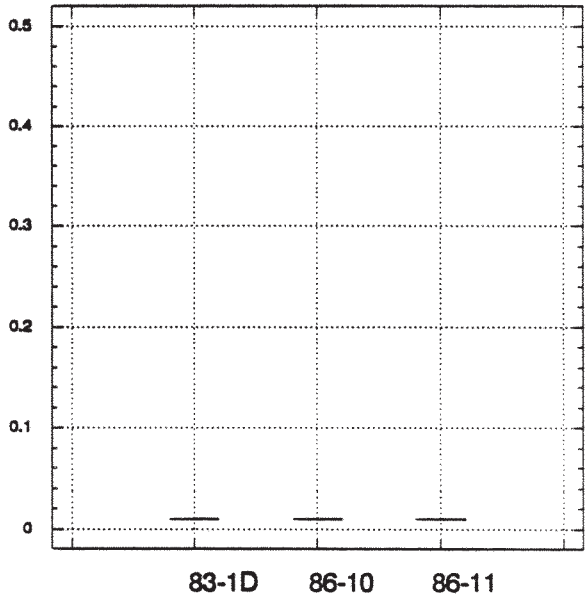


Figure E-31. Phenols (mg/L) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

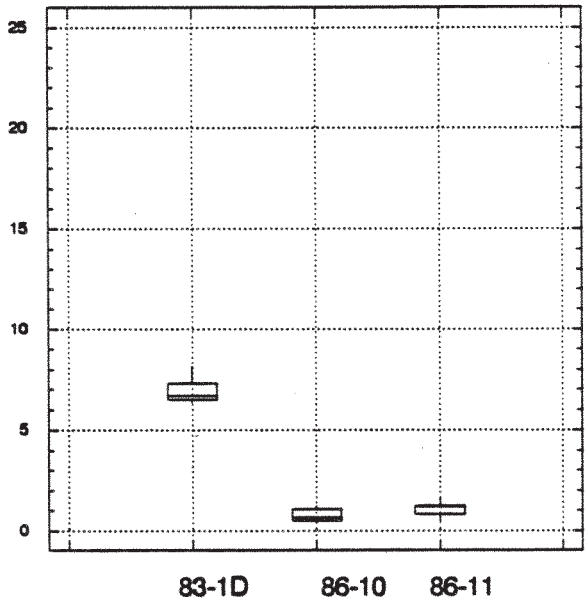


Figure E-32. Chloride (mg/L) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

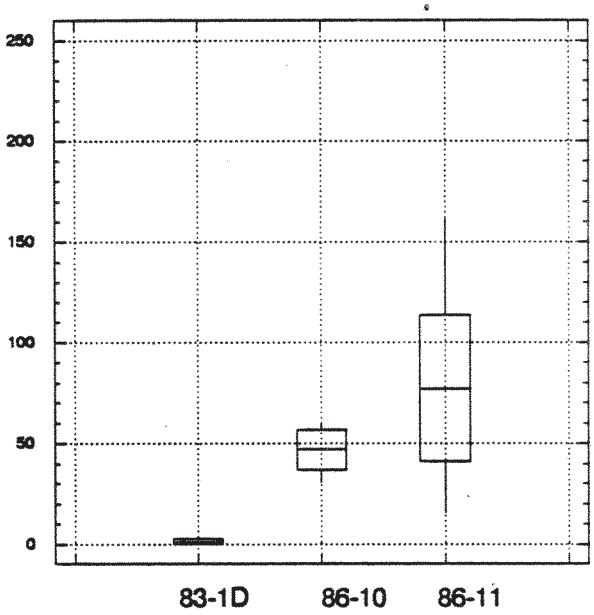


Figure E-33. Sulfate (mg/L) in well samples from the NRC-Licensed Disposal Area Groundwater Mon itoring Unit.

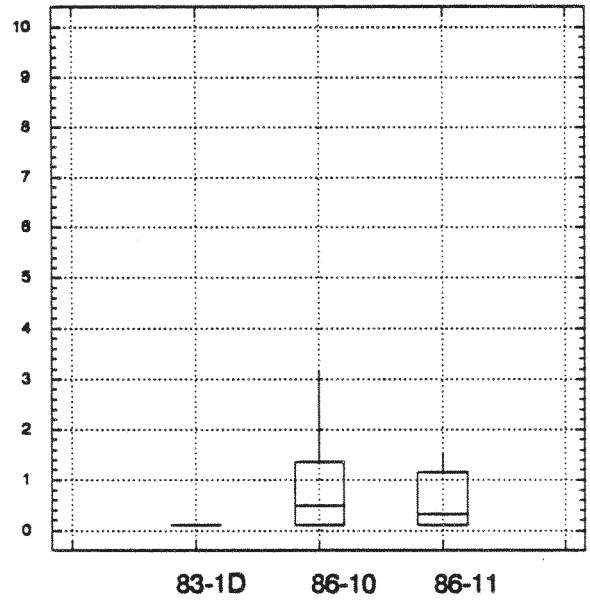


Figure E-34. Nitrate (mg/L) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

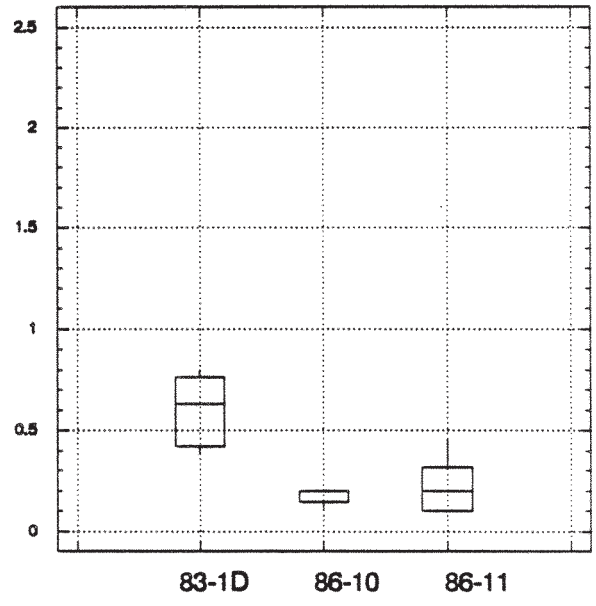


Figure E-35. Fluoride (mg/L) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

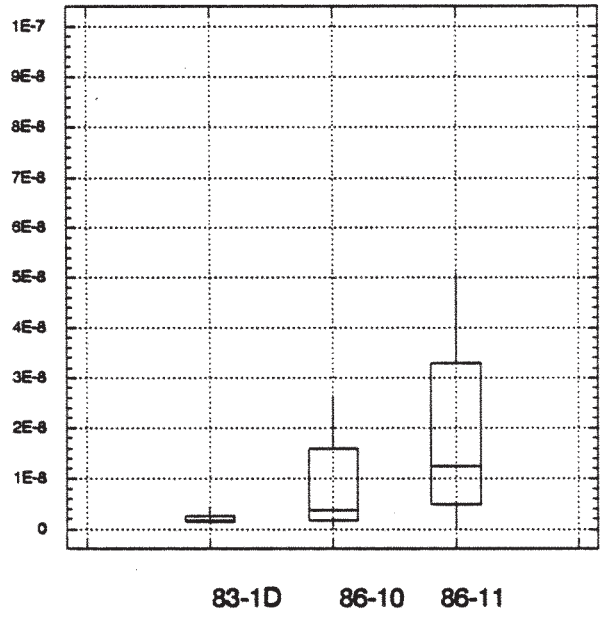


Figure E-36. Gross alpha levels (μCi/mL) for well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

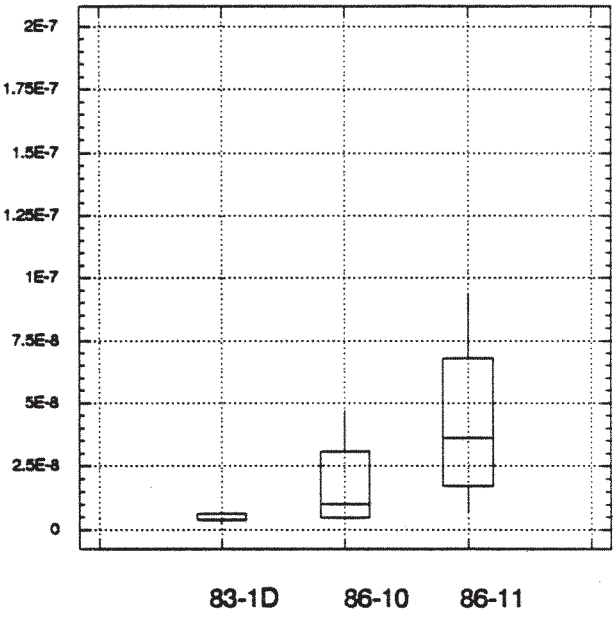


Figure E-37. Gross beta levels (μCi/mL) for well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

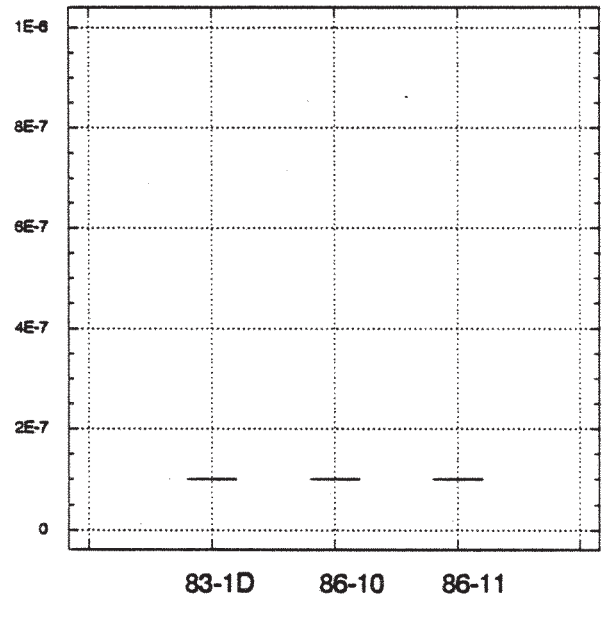


Figure E-38. Tritium (H-3) levels (μCi/mL) in well samples from the NRC-Licensed Disposal Area Goundwater Monitoring Unit.

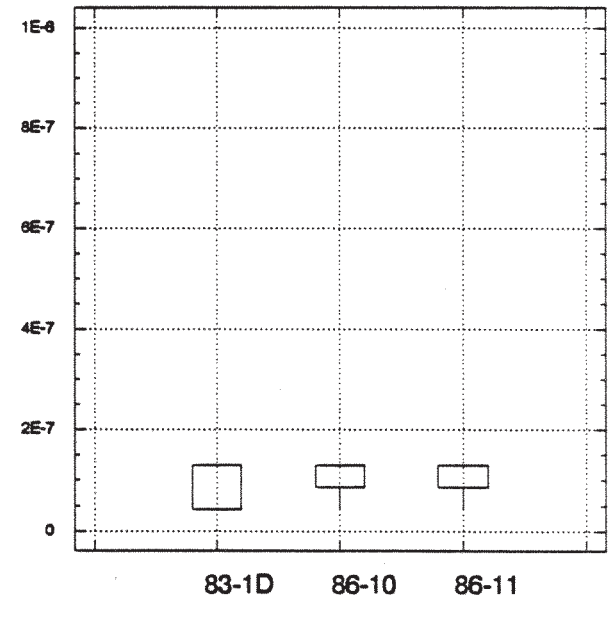


Figure E-39. Cesium-137 levels (μCi/mL) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.

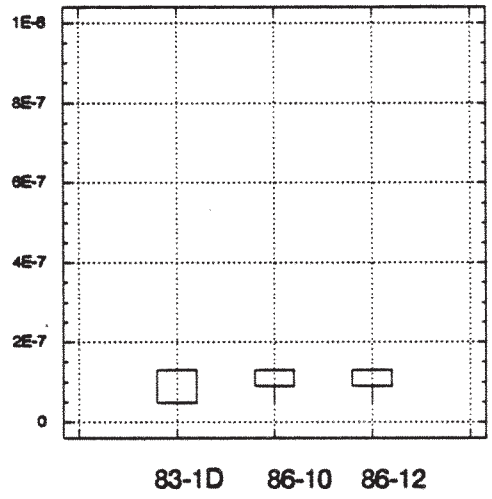


Figure E-40. Cobalt-60 levels (μCi/mL) in well samples from the NRC-Licensed Disposal Area Groundwater Monitoring Unit.