Appendix A-1 – Information from "RemoteHandled.xls" Workbook for Lined Shafts

Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
200	811387	4/14/1981	Fuel cans #3021 & 3008	20.2	8.1	2.5	1.5	1.24	1.73E-05	140	2.5
200	811390	4/14/1981	Fuel cans #3010 & 3016	10	38.0	6	3.5	0.615	8.14E-05	800	6
200	811396	4/14/1981	Plastic cans #3061 & 3053, Grinding papers, Kimwipes, plastic	0.1	0.4	0.6	0.3	0.00614	8.56E-07	60	0.6
200	811398	4/14/1981	Cans #3051 & 3052, Catch & drain pans, Kimwipes	4	16.0	0.6	0.3	0.246	3.42E-05	120	0.6
200	811471	4/14/1981	Trash cans #2864 & 2846	12.5	21.5	2.7	1.6	0.768	4.60E-05	700	9
200	811473	4/14/1981	Trash fuel cans #2877 & 2863	5	49.0	20	11.6	0.307	1.05E-04	1150	20
201	791484	6/29/1979	One fuel can #2171, Tin can in plastic container	3	1.0	4	2.2	0.184	2.16E-06	17.5	4
201	794215	6/29/1979	Trash and Fuel cans #1854 & 1851	0.5	2.0	11	6.1	0.0307	4.28E-06	266	11
201	794216	6/29/1979	Fuel and trash cans #1798 & 1953, cans in plastic bags	2.25	9.0	8.5	4.7	0.138	1.93E-05	261	85
201	794218	6/29/1979	Fuel cans #2002 & 2003, tin cans in plastic cans in plastic bags	2.5	10.0	1	0.6	0.154	2.15E-05	15	1
201	794219	6/29/1979	Cans #2004 & 1992, Fuel & trash can, tin cans in plastic cans in plastic bags	1.5	5.0	1.3	0.7	0.0921	1.07E-04	27	1.3
201	794220	6/29/1979	Cans 1 & 4A, hot trash Met samples	68	147.0	30	16.7	4.18	3.15E-04	1200	30
201	794221	6/29/1979	Fuel samples, cans 2 & 3A	141	370.0	35	19.5	8.66	7.92E-04	1050	35
202	803548		Hot cell waste CMB1 & CMB14	65.4	223.0	245	21.2	4.01	4.77E-04		
203	803547		Hot cell waste CMB1 & CMB14	37.5	127.0	109	9.5	2.3	2.72E-04		
204	791472	6/29/1979	Trash and Fuel cans #2127 & 2150	1.75	5.3	10.5	5.9	0.108	1.12E-05	108	10.5
204	791478	6/29/1979	Hot trash cans #2015 & 2117	35	121.0	0	0.0	2.15	2.59E-04	1000	140
204	791483	6/29/1979	Fuel cans #2095 & 2167, tin cans in plastic cans	1.5	4.5	15	8.4	0.0921	9.63E-06	50	15
204	794222	6/29/1979	Fuel cans #1790 & 1815	4.75	19.0	0	0.0	0.292	4.07E-05		100
204	794223	6/29/1979	Trash in 1-gal cans #1786,1813 in plastic bag	16.5	43.8	20	11.2	1.01	9.73E-05		20.4
205	801483	12/1/1980	Trash cans #2875 & 2926	0.1	0.1	135	77.9	0.0614	2.14E-06	1000	135
205	801485	12/1/1980	Trash cans #2928 & 2930	25	95.0	170	98.0	1.54	2.03E-04	1000	170
205	802244	12/1/1980	Fuel trash cans #2574 & 2577	0.5	20.0	4.1	2.4	0.0307	4.28E-05	160	41
205	802246	12/1/1980	Fuel trash cans #2604 & 2584	17.5	70.0	14	8.1	1.08	1.50E-04	1000	14
205	802247	12/1/1980	Fuel trash cans #2603 & 2602	5	21.0	12	6.9	0.307	4.49E-05	615	12
205	802259	12/1/1980	Cans #2642, 2669, Cell waste	12	39.0	35	20.2	0.737	8.35E-05	1000	35
205	802287	12/1/1980	Cans #2785 & 2646, Hot trash	57	236.0	520	299.9	3.5	5.05E-05	1000	520
206	812291	4/1/1981	Cans #2805 & 2806, 15 Met samples	123	321.0	40	23.2	7.55	6.87E-04	1000	40

Appendix A-1 – Information from "RemoteHandled.xls" Workbook for Lined Shafts

Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
206	812292	4/1/1981	Cans #2801 & 2804, 15 Met samples	100	269.0	22	12.8	6.14	5.76E-04	1000	22
206	812293	4/1/1981	Waste cans #2454 & 2812	7	28.0	108	62.8	0.431	6.00E-05	1050	108
206	812297	4/1/1981	Cans # 2829 & 2807, Trash & fuel	22	86.0	100	58.1	1.35	1.84E-04	1000	100
206	812298	4/1/1981	Cans #2826 & 2827,Trash and Fuel	22	86.0	100	58.1	1.35	1.84E-04	1000	100
206	812302	4/1/1981	Hot trash cans #2883 & 2865	8	23.0	8.2	4.8	0.491	4.92E-05	1010	82
206	812303	4/1/1981				8.2	4.8	0.491	4.92E-05		
207	811397	5/29/1981	Plastic cans #3069 & 3055, Grinding papers, Kimwipes, plastic	0.1	0.4	2	1.2	0.00614	8.56E-07	60	2
207	811400	5/29/1981	Cans #3046 & 3060, Glass, Paper, etc	0.1	0.4	3.5	2.0	0.00614	8.56E-07	290	3.5
207	811401	5/29/1981	Cans #3065 & 3067, Fuel, plastic bottles	1.06	4.2	5.15	3.0	0.0651	9.07E-06	170	5.15
207	811406	5/29/1981	Plastic cans #3103 & 3101, Grinding papers, Kimwipes, plastic	0.1	0.4	2.5	1.5	0.00614	8.56E-07	150	2.5
207	814978	5/29/1981	Wipes, polishing cloth, plastic, cans#3104,3097	0.06	0.2	0.18	0.1	0.00368	5.14E-07	3.6	0.18
208	810794	6/22/1981	Fuel trash cans #3123, 3126	28.5	101.0	100	58.4	1.75	2.17E-04	1000	100
208	810802	6/22/1981	Can #3119, Hot trash	0.1	0.4	0.06	0.0	0.00614	8.56E-07	1	0.06
208	811405	6/22/1981	Plastic cans #3096 & 3102, Catch pans, grinding paper, towels	0.5	2.0	2	1.2	0.0307	4.28E-06	80	2
208	811408	6/22/1981	Can #3093, Wipes, polishing cloth, plastics	0.1	0.4	0.08	0.0	0.00614	8.56E-07	1.5	0.08
208	811409	6/22/1981	Plastic cans #3092 & 3110, Catch pans, fuel, grinding papers	0.1	0.4	2.1	1.2	0.00614	8.56E-07	32	2.1
208	811411	6/22/1981	Plastic cans #3094 & 3116, Grinding papers, plastic, towels	0.1	0.4	1	0.6	0.00614	8.56E-07	29	1
208	814979	6/22/1981	Wipes, polishing cloth, plastic, cans#3100,3109	0.04	0.2	0.12	0.1	0.00246	3.42E-07	2.4	0.12
209	810795	6/22/1981	Plastic cans #3098, 3131, Trash, Plastic, paint, vermiculite	0.1	0.4	1	0.6	0.00614	8.56E-07	15	1
209	810797	6/22/1981	Plastic cans #3118, 3129, Trash, wipes, chips, plastic	0.1	0.4	0.4	0.2	0.00614	8.56E-07	2.8	0.4
209	810798	6/22/1981	Plastic cans #3111, 3114, Vermiculite, wipes, plastic, paint	0.1	0.4	0.2	0.1	0.00613	8.56E-07	1.6	0.2
209	810799	6/22/1981	Trash cans #2125, 3108, 3117, 3130	0.1	0.4	0.3	0.2	0.00614	8.56E-07	5	0.3
209	811412	6/22/1981	Plastic cans #3091 & 3115, Grinding paper, plastic, glass	0.1	0.4	2	1.2	0.00614	8.56E-07	90	2
210	810800	6/22/1981	Cans #3145, 3147, Hot trash	0.1	0.4	0.4	0.2	0.00614	8.56E-07	10	0.4
210	810804	6/22/1981	Cans #3139, 3133, 3135, 3132, Hot trash	0.1	0.4	0.2	0.1	0.00614	8.56E-07	4	0.2

Appendix A-1 – Information from "RemoteHandled.xls" Workbook for Lined Shafts

Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
210	810805	6/22/1981	Cans #3143, 3146, 2969, 3151, hot trash	0.1	0.4	0.3	0.2	0.00614	8.56E-07	5	0.3
210	810806	6/22/1981	Cans #3150 & 3153, hot trash cans	0.1	0.4	0.02	0.0	0.00614	8.56E-07	0.3	0.02
211	810807	10/6/1981	Plastic cans #3145 & 3147, Hot trash	0.1	0.4	0.7	0.4	0.00614	8.56E-07	16	0.7
211	810808	10/6/1981	Cans #3158 & 3159, Hot trash, glass, plastic, paper	0.1	0.4	2.2	1.3	0.00614	8.56E-07	126	2.2
211	810809	10/6/1981	Plastic cans #3162 &3167, Trash catch pans, plastic, wipes	0.1	0.4	4	2.4	0.00614	8.56E-07	160	4
211	810810	10/6/1981	Cans #3160,3161,3168,3169, Cold trash, Plastic, bottles, wipes	0.1	0.4	0.06	0.0	0.00614	8.56E-07	1	0.06
211	812669	10/6/1981	Cans #3178 & 3179, Fuel, glass, etc.	6.56	26.0	11	6.5	0.403	5.56E-05	940	11
212	803758	4/9/1980	LAMPRE reactor vessel sealed in 1/4" steel cask with concrete	200	0.0		0.0	12.4		1.8	0.3
213	812684	11/3/1981	Cell waste & Fuel cell 16 waste, plastic can #3248	32.6	138.0	40.8	24.0	2	2.95E-04	1000	40.8
213	812686	11/3/1981	Cans #3245 &3246, Fuel, glass, towels	4.33	17.3	7	4.1	0.266	3.70E-05	500	7
213	812688	11/3/1981	Fuel and Hot trash in cans #3273 & 3274	12.8	77.9	101	59.5	0.787	1.67E-04	1000	101
213	812689	11/3/1981	Cell waste cans #3266 & 3272	0.2	1.0	2.8	1.7	0.0124	2.14E-06	160	2.8
214	820057	4/20/1982	Trash can #3338, Kimwipes, glassware, Lucite can in Steel nipple	0.1	0.4	0.3	0.2	0.00614	8.56E-07	15	0.3
214	820058	4/20/1982	Trash can #3351, Kimwipes, glassware, Lucite can in steel nipple	0.1	0.4	0.12	0.1	0.00614	8.56E-07	4	0.12
214	821822	4/20/1982	Trash can #3369, Kimwipes, paper	0.1	0.4	0.4	0.2	0.00614	8.56E-07	25	0.4
214	821823	4/20/1982	Trash can #3373, Paper, plastic	0.1	0.4	0.45	0.3	0.00614	8.56E-07	30	0.45
214	821826	4/20/1982	Waste can #3378, Glass & plastic bottles	0.1	0.4	0.4	0.2	0.00614	8.56E-07	20	0.4
214	823410	4/20/1982	Hot trash cans #3307 & #3278	0.1	0.4	1.3	0.8	0.00614	8.56E-07	110	1.3
215	820041	6/9/1982	Fuel can #3312	15.27	71.26	30	17.9	0.938	1.53E-04	1000	30
215	820042	6/9/1982	Waste can #3307	0.1	0.4	15	9.0	0.00614	8.56E-07	140	15
215	821832	6/9/1982	Trash can #3393, Hot trash Lucite can in Steel Nipple	0.1	0.4	2	1.2	0.00614	8.56E-07	35	2
215	821833	6/9/1982	Hot trash can #3300	0.1	0.4	3	1.8	0.00614	8.56E-07	100	3
215	821834	6/9/1982	Hot trash can #3397	0.1	0.4	2	1.2	0.00614	8.56E-07	200	2
215	821835	6/9/1982	Hot trash can #3383, Grinding papers, Kimwipes	0.1	0.4	0.3	0.2	0.00614	8.56E-07	40	0.8
215	821837	6/9/1982	Hot trash can #3415, Bottles, Kimwipes	0.1	0.4	2	1.2	0.00614	8.56E-07	20	2
216	821825	6/9/1982	Can #3373, Glass, towels, plastic etc.	0.1	0.4	0.8	0.5	0.00614	8.56E-06	40	0.8
216	821836	6/9/1982	Hot trash can #3416, bootie, Kimwipes	0.1	0.4	2	1.2	0.00614	8.56E-07	20	2
216	821838	6/9/1982	Hot trash can #3395, Grinding, Kimwipes, plastic	0.1	0.4	1	0.6	0.00614	8.56E-07	15	1

Appendix A-1 – Information from "RemoteHandled.xls" Workbook for Lined Shafts

Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
216	821839	6/9/1982	Hot trash can #3405, Vermiculite, wipes	0.1	0.4	0.2	0.1	0.00614	8.56E-07	8	0.2
216	821840	6/9/1982	Hot trash can #3384	0.1	0.4	4	2.4	0.00614	8.56E-07	200	4
216	821841	6/9/1982	Hot trash can #3385, Kimwipes, grinding papers	0.1	0.4	2	1.2	0.00614	8.56E-07	30	2
217	821870	9/13/1982	Can #3451, Glass & plastic bottles	0.1	0.4	1.5	0.9	0.00614	8.56E-07	15	1.5
217	821871	9/13/1982	Can #3452, Fuel, scrap card boxes	3.2	12.9	4.5	2.7	0.197	2.75E-05	100	4.5
217	821874	9/13/1982	Hot trash, grinding paper, etc., bottom entry cask	0.1	0.4	10	6.0	0.00614	8.56E-07	80	1
217	821882	9/13/1982	Trash can #3478	0.1	0.4	1	0.6	0.00614	8.56E-07	6	1
217	821915	9/13/1982	Can #3446, Waste Fuel and Cell trash	22.8	60.0	1	0.6	1.4	1.28E-04	1000	150
217	821918	9/13/1982	Can #3437, Fuel, scrap card boxes	3.2	12.9	1	0.6	0.197	2.75E-05	900	10
218	821875	9/13/1982	Trash can #3499	0.1	0.4	20	12.0	0.00614	8.56E-07	300	20
218	821879	9/13/1982	Trash catch pan can #3477	2	9.0	30	18.0	0.123	1.92E-05	500	30
218	821881	9/13/1982	Trash can #3468	2	9.0	40	24.1	0.123	1.93E-05	900	40
218	821883	9/13/1982	Trash can #3469	0.1	0.4	6	3.6	0.00614	8.56E-07	200	6
218	821916	9/13/1982	Cropper disposal and Fuel can #3489	40.4	82.8	30	18.0	2.48	1.77E-04	1000	30
218	821917	9/13/1982	Trash can #5	0.1	0.4	6	3.6	0.00614	8.56E-07	300	6
219	832830	3/10/1983	Grinding waste can #3527	0.1	0.4	20	12.2	0.00614	8.56E-07	1000	20
219	832831	3/10/1983	Trash can #3727	0.1	0.4	0.8	0.5	0.00614	8.56E-07	30	0.8
219	832832	3/10/1983	Fuel & hardware can #3724	40.47	236.0	150	91.2	2.49	5.05E-04	1000	150
219	832833	3/10/1983	Hot waste can #3725	0.1	0.4	30	18.2	0.00614	8.56E-07	200	30
219	832834	3/10/1983	Hot trash can #3524	0.1	0.4	50	30.4	0.00614	8.56E-07	1000	50
219	832835	3/10/1983	Hot Cell Trash, can #3495	4.98	20.2	100	60.8	0.306	4.32E-05	1000	100
220	832836	3/10/1983	Waste can #3728	0.1	0.4	100	60.8	0.00614	8.56E-07	1000	100
220	832837	3/10/1983	Waste can #3491	0.11	0.4	100	60.8	0.00675	8.56E-07	1000	100
220	832838	3/10/1983	Hot cell trash #3706	0.1	0.4	2	1.2	0.00614	8.56E-07	100	2
220	832839	3/10/1983	Grinding can #3528	0.1	0.4	8	4.9	0.00614	8.56E-07	200	8
220	832840	3/10/1983	Grinding can #3522	0.1	0.4	200	121.6	0.00614	8.56E-07	1000	200
220	832841	3/10/1983	Wire wrap #3726	0.1	0.4	50	30.4	0.00614	8.56E-07	1000	50
221	832842	3/10/1983	Wire wraps #3554	0.1	0.4	15	9.1	0.00614	8.56E-07	400	15
221	832843	3/10/1983	Wire wraps #3507	0.1	0.4	30	18.2	0.00614	8.56E-07	1000	30
221	832844	3/10/1983	Hot trash can #3569	0.1	0.4	40	24.3	0.00614	8.56E-07	800	40
221	832845	3/10/1983	Hot trash can #3722	0.1	0.4	1.5	0.9	0.00614	8.56E-07	60	1.5

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Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
221	832846	3/10/1983	Hot trash can #3720	0.1	0.4	60	36.5	0.00614	8.56E-07	200	60
221	832847	3/10/1983	Waste can #3721	0.1	0.4	30	18.2	0.006124	8.56E-07	200	60
222	830716	12/14/1983	Can#3712, Fuel scrap paper, etc	0.564	2.3	20	12.4	0.0342	4.82E-06	900	20
222	830717	12/14/1983	Can#3718, Fuel scrap paper, etc	0.564	2.3	200	123.8	0.0346	4.82E-06	1000	200
222	830781	12/14/1983	Trash 1 can, bottom entry steel can #1	0.05	0.2	1	0.6	0.00377	4.26E-07	20	1
222	830787	12/14/1983	Trash 1 can, bottom entry steel can #10	0.12	0.5	40	24.8	0.00905	1.07E-06	200	40
222	830788	12/14/1983	Trash 1 can, bottom entry steel can #6	0.12	0.5	40	24.8	0.00905	1.07E-06	100	40
222	830789	12/14/1983	Trash 1 can, Steel can #8	0.1	0.4	0.2	0.1	0.00754	8.53E-07	10	0.2
222	830790	12/14/1983	Trash 1 can, Steel can #9	2.91	11.64	40	24.8	0.219	2.48E-05	200	40
223	830782	12/14/1983	Trash 1 can, bottom entry steel can #5	0.05	0.2	25	15.5	0.00377	4.26E-07	100	25
223	830783	12/14/1983	Trash 1 can, bottom entry steel can #3	0.1	0.4	3	1.9	0.00754	8.53E-07	25	3
223	830784	12/14/1983	Trash 1 can, bottom entry steel can #4	0.1	0.4	3	1.9	0.00754	8.53E-07	30	3
223	830785	12/14/1983	Trash 1 can, bottom entry steel can #7	0.1	0.4	3	1.9	0.00754	8.53E-07	70	3
223	830786	12/14/1983	Trash 1 can, Steel can #2	0.05	0.2	1.5	0.9	0.00377	4.26E-07	20	1.5
223	830791	12/14/1983	Trash 1 can, bottom entry steel can #11	0.1	0.4	1.5	0.9	0.00754	8.53E-07	32	1.5
224	852326	12/30/1985	Waste, plastic can #4088, steel can #58	0.1	0.4	4	2.6	0.00614	8.56E-07	300	4
224	852328	12/30/1985	Waste plastic can #4097, Steel can #61	0.1	0.4	2	1.3	0.00614	8.56E-07	100	2
224	852332	12/30/1985	Waste plastic can #4072, Steel can #32	0.1	0.4	4	2.6	0.00614	8.56E-07	300	4
224	852804	12/30/1985	Trash can #3660, Fuel inside Steel can #67	3.3	8.7	2.8	1.8	0.203	1.86E-05	100	2.8
224	855064	12/30/1985	Trash can #3661, Fuel inside Steel can #63	3.6	14.9	3.3	2.1	0.221	3.19E-05	100	3.3
224	855065	12/30/1985	Trash can #3662, Fuel inside Steel can #66	3.6	14.9	4.2	2.7	0.221	3.19E-05	300	4.2
224	855066	12/30/1985	Trash can #3663, trash only, Steel can #65	0.1	0.4	1.5	1.0	0.00614	8.56E-07	70	1.5
224	855068	12/30/1985	Trash can #3664, Fuel inside Steel can #64	0.1	0.4	1.5	1.0	0.00614	8.56E-07	20	0.5
225	840848	12/31/1984	Waste plastic can #4076, Steel can #21	0.1	0.4	0.4	0.3	0.00614	8.56E-07	40	0.4
225	840854	12/31/1984	Waste plastic can #4033, Steel can #24	0.1	0.4	1.5	1.0	0.00614	8.56E-07	50	1.5
225	840856	12/31/1984	Waste plastic can #4043, Steel can #31	0.1	0.4	1.5	1.0	0.00614	8.56E-07	90	1.5
225	840857	12/31/1984	Waste plastic can #4035, Steel can #30	0.1	0.4	3	1.9	0.00614	8.56E-07	105	3
225	840863	12/31/1984	Waste plastic can #4046, Steel can #40	0.1	0.4	0.08	0.1	0.00614	8.56E-07	10	0.08
225	840864	12/31/1984	Waste plastic can #4044, Steel can #34	0.1	0.4	0.3	0.2	0.00614	8.56E-07	25	0.3
225	840867	12/31/1984	Waste plastic can #4054, Steel can #38	0.1	0.4	0.4	0.3	0.00614	8.56E-07	30	0.4
225	840874	12/31/1984	Trash can #4051, Steel can #43	0.1	0.4	0.2	0.1	0.00614	8.56E-07	15	0.2

Appendix A-1 – Information from "RemoteHandled.xls" Workbook for Lined Shafts

Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
226	840842	12/31/1984	Waste plastic can #4056, Steel can #20	0.1	0.4	2	1.3	0.00614	8.56E-07	90	2
226	840843	12/31/1984	Waste plastic can #4045, Steel can #36	0.1	0.4	2	1.3	0.00614	8.56E-07	80	2
226	840844	12/31/1984	Waste plastic can #4023, Steel can #19	0.1	0.4	1.5	1.0	0.00614	8.56E-07	70	1.5
226	840845	12/31/1984	Waste plastic can #4034, Steel can #22	0.1	0.4	0.3	0.2	0.00614	8.56E-07	21	0.3
226	840846	12/31/1984	Waste plastic can #4024, Steel can #25	0.1	0.4	5	3.2	0.00614	8.56E-07	300	5
226	840847	12/31/1984	Waste plastic can #4022, Steel can #23	0.1	0.4	1.5	1.0	0.00614	8.56E-07	70	1.5
226	840862	12/31/1984	Waste plastic can #4027, Steel can #39	0.1	0.4	0.2	0.1	0.00614	8.56E-07	15	0.2
226	840868	12/31/1984	Waste plastic can #4025, Steel can #35	0.1	0.4	0.3	0.2	0.00614	8.56E-07	35	0.3
227	840877	12/31/1984	Trash can #4050, Fuel inside Steel can #42	2.2	8.9	1.5	1.0	0.135	0.0000191	80	1.5
227	840878	12/31/1984	Trash can #4042, Fuel inside Steel can #46	3.1	14.4	2.5	1.6	0.19	0.0000308	250	2.5
227	840879	12/31/1984	Trash can #4041, Fuel inside Steel can #44	3.1	14.4	4	2.5	0.19	0.0000308	300	4
227	840880	12/31/1984	Trash can #4048, Fuel inside Steel can #45	3.1	14.4	2.5	1.6	0.19	0.0000308	350	2.5
227	840881	12/31/1984	Trash can #4057, Fuel inside Steel can #51	3.1	14.4	3	1.9	0.19	0.0000308	200	3
227	840883	12/31/1984	Trash can #4064, Steel can #48	0.1	0.4	2	1.3	0.00614	8.56E-07	100	2
227	840885	12/31/1984	Trash can #4056, Fuel inside Steel can #49	3.2	10.6	6	3.8	0.197	0.0000227	400	6
227	840886	12/31/1984	Trash can #4084, Steel can #50	0.1	0.4	0.8	0.5	0.00614	8.56E-07	15	0.8
228	874123	12/23/1987	Trash can #4032, Steel can #54	0.1	0.4	0.15	0.1	0.00614	8.56E-07	9	0.15
228	874124	12/23/1987	Waste plastic can #4093, Steel can #55	0.1	0.4	1.5	1.0	0.00614	8.56E-07	20	1.5
228	874125	12/23/1987	Waste can #4164, Steel can #62	0.1	0.4	0.15	0.1	0.00614	8.56E-07	10	0.12
228	874126	12/23/1987	Waste plastic can #4086, Steel can #57	0.1	0.4	2.5	1.7	0.00614	8.56E-07	200	2.5
228	874127	12/23/1987	Waste plastic can #4094, Steel can #56	0.1	0.4	1.5	1.0	0.00614	8.56E-07	?	1.5
228	874128	12/23/1987	Waste plastic can #4092, Steel can #60	0.1	0.4	1.5	1.0	0.00614	8.56E-07	?	1.5
228	874129	12/23/1987	Waste, plastic can #4085, steel can #59	0.1	0.4	1.5	1.0	0.00614	8.56E-07	60	1.5
228	874130	12/23/1987	Trash can #4053, steel can #53	0.1	0.4	2	1.4	0.00614	8.56E-07	80	2
229	840851	12/31/1984	Waste plastic can #4028, Steel can #28	0.1	0.4	3	1.9	0.00614	8.56E-07	200	3
229	840855	12/31/1984	Waste plastic can #4145, Steel can #27	0.1	0.4	1	0.6	0.00614	8.56E-07	40	1
229	840860	12/31/1984	Waste plastic can #4026, Steel can #36	0.1	0.4	2	1.3	0.00614	8.56E-07	150	2
229	840865	12/31/1984	Waste plastic can #4055, Steel can #37	0.1	0.4	0.1	0.1	0.00614	8.56E-07	10	0.1
229	840873	12/31/1984	Trash can #4065, Steel can #41	3	12	2	1.3	0.184	0.0000257	100	2
229	840882	12/31/1984	Trash plastic can #4066, steel can #47	0.1	0.4	0.3	0.2	0.00614	8.56E-07	18	0.3
229	840888	12/31/1984	Trash can #4075, Steel can #52	0.1	0.4	0.15	0.1	0.00614	8.56E-07	10	1.5

Appendix A-1 – Information from "RemoteHandled.xls" Workbook for Lined Shafts

Shaft Number	RSWD Number	Date Placed	Waste Description	Grams of Pu-239	Grams of U-235	MFP (Ci)*	Decayed MFP (Ci)*	Curies of Pu-239	Curies of U-235	Contact Dose Rate (R/hr)	1 Meter Dose Rate (R/hr)
230	840831	12/31/1984	Hot waste can #4017, Steel can #13	96	245	35	22.2	5.89	0.000524	1000	35
230	840835	12/31/1984	Waste plastic can #4153, Steel can #16	0.1	0.4	10	6.3	0.00614	8.56E-07	100	1
230	840836	12/31/1984	Waste plastic can #3974, Steel can #15	0.1	0.4	0.4	0.3	0.00614	8.56E-07	30	0.4
230	840838	12/31/1984	Waste, plastic can #4154, steel can #14	0.1	0.4	5	3.2	0.00614	8.56E-07	400	5
230	840839	12/31/1984	Waste, plastic can #4155, steel can #18	0.1	0.4	1.5	1.0	0.00614	8.56E-07	90	1.5
230	840840	12/31/1984	Waste, plastic can #4037, steel can #29	0.1	0.4	1	0.6	0.00614	8.56E-07	90	1
230	840841	12/31/1984	Waste, plastic can #4036, steel can #17	0.1	0.4	0.7	0.4	0.00614	8.56E-07	60	0.7
230	840859	12/31/1984	Waste, plastic can #4031, steel can #33	0.1	0.4	1	0.6	0.00614	8.56E-07	40	1
231	855046	12/30/1985	Vacuum cleaner motor, plastic can #3813, steel can #72	0.1	0.4	3	1.9	0.00614	8.56E-07	1000	30
231	855047	12/30/1985	Manipulator boot, plastic can #4114, steel can #73	0.1	0.3	3	1.9	0.00614	6.42E-07	1000	6.5
231	855048	12/30/1985	Trash plastic can #3859, steel can #74	0	15	0.9	0.6	0	0.0000321	100	0.9
231	855049	12/30/1985	RB. Robinson Fuel, can #3651, steel can #75	0	9	0.4	0.3	0	0.0000193	3	0.04
231	856015	12/30/1985	Plastic can #3649, steel can #68	0.1	0.4	2.1	1.4	0.00614	8.56E-07	1000	22
231	856016	12/30/1985	Plastic waste can #4113, steel can #69	0.1	0.3	6	3.9	0.00614	6.42E-07	20	0.6
231	856017	12/30/1985	Plastic and can trash #3626, steel can #71	0.1	0.3	6	3.9	0.00614	6.42E-07	500	6
231	856018	12/30/1985	Plastic and can trash #3625, steel can #70	0.1	0.4	1	0.6	0.00614	8.56E-07	350	7
232	874132	12/23/1987	Three Mile Island waste, can #77	0	7	0	0.0	0	2.61E-06	6.5	0
232	874133	12/23/1987	Waste can #79		134.8	0	0.0	5.83	0.000289	1000	
232	874134	12/23/1987	Waste steel can #78	1	48	0	0.0	0.0943	1.367E-05	29	

* Assume units, original information source does not indicate units.

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
Shaft 200	S811387	14-Apr-81	16.00	0.21	Non-combustible hot-cell waste	Cell 14 fuel can 3021, 300b cell 13 140 R at contact	U-235	8.08	0
							Pu-239	20.20	
							MFP		
Shaft 200	S811390	14-Apr-81	16.00			Cell #14 fuel cans #3010 & 3016 800 R at contact	U-235	38.04	0
							Pu-239	10.01	
							MFP		
Shaft 200	S811396	14-Apr-81	16.00	0.21	Combustible hot-cell waste	Cell 13 grinding papers kimwipes plastic cans 3061 3053	U-235	0.40	60,000
							Pu-239	0.10	
							MFP		
Shaft 200	S811398	14-Apr-81	20.00			Cell 13 catch & drain pans kimwipes 120,000mR/hr surface cans 3051 3052	U-235	16.00	0
							Pu-239	4.00	
							MFP		
Shaft 200	S811471	14-Apr-81	9.00	0.21	Non-combustible hot-cell waste	Cell 14 trash cans 2864 2846 700 R/hr at contact	U-235	21.50	0
							MFP		
							Pu-239	12.50	
Shaft 200	S811473	14-Apr-81	16.00	0.21	Non-combustible hot-cell waste	Cell 14 trash fuel cans #2877 2863 1150 R/hr at contact	U-235	49.00	0
							MFP		
							Pu-239	5.00	
Shaft 201	S791484	29-Jun-79	0.00	0.09	Non-combustible hot-cell waste	Cell 12 one fuel can 2171 tin can in plastic container	MFP		17,500
							Pu-239	3.00	
							U-235	1.00	
Shaft 201	S794215	29-Jun-79	14.99	0.16	Non-combustible hot-cell waste	Cell 12 trash + fuel 1854,1851 266,000 mR at contact	U-235	2.00	0
							MFP		
							Pu-239	0.50	
Shaft 201	S794216	29-Jun-79	14.99		Combustible hot-cell waste	Cell 12 trash and fuel can 1798 + 1953 261,000 mR at contact cans in p-bag	U-235	9.00	0

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
							Pu-239	2.25	
Shaft 201	S794218	29-Jun-79	9.92			Cell 14 fuel can no. 2002 + 2003 tin cans in plastic cans in p-bags	U-235	10.00	15,000
							Pu-239	2.50	
							MFP		
Shaft 201	S794219	29-Jun-79	11.91		Non-combustible hot-cell waste	Cell 14 fuel + trash can no. 2004 + 1992 tin cans in plastic cans in p-bags	MFP		27,000
							Pu-239	1.50	
							U-235	5.00	
Shaft 201	S794220	29-Jun-79	5.95	0.16	Combustible hot-cell waste	Hot trash met samples cans 1 and 4a 1200 R/hr at contact	U-235	147.00	0
							Pu-239	68.00	
							MFP		
Shaft 201	S794221	29-Jun-79	7.94			Fuel samples from cells 13,15 cans 2 13a 1050 R/hr at contact	U-235	370.00	0
							Pu-239	141.00	
							MFP		
Shaft 202	S803548	30-Apr-80	4600.73	1.20	Non-combustible hot-cell waste	Hot cell waste cmb1 +cmb14 from 9/5/79 thru 1/10/80	U-235	222.90	0
							MFP		
							Pu-239	65.36	
Shaft 203	S803547	30-Apr-80	4600.73	1.20	Non-combustible hot-cell waste	Hot cell waste cmb-1 + cmb14 from 12/13/ 78 thru 8/15/79	U-235	127.00	0
							Pu-239	37.50	
							MFP		
Shaft 204	S791472	29-Jun-79	20.07	0.21	Non-combustible hot-cell waste	Cell 12 trash + fuel cans 2127 + 2150 108000 mR at contact	U-235	5.25	0
							Pu-239	1.75	
							MFP		
Shaft 204	S791478	29-Jun-79	14.99	0.21	Combustible hot-cell waste	Cell 9 hot trash cans 2015,2117,1000pR/hr at contact 140000mR/hr at meter	MFP		0
							Pu-239	35.00	
							U-235	121.00	

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
Shaft 204	S791483	29-Jun-79	14.99	0.21	Non-combustible hot-cell waste	Cell12 fuel cans 2095+2167 tin cans in plastic bags	U-235	4.50	50,000
							Pu-239	1.50	
							MFP		
Shaft 204	S794222	29-Jun-79	16.10			Cell 12 fuel cans 1790 + 1815 100,000 hr at 1 meter	Pu-239	4.75	0
							U-235	19.00	
							MFP		
Shaft 204	S794223	29-Jun-79	20.07	0.21	Non-combustible hot-cell waste	Cell 9 trash in 1 gal. Disposable cans in plastic bag, cans 1786 + 1813	U-235	43.80	0
							MFP		
							Pu-239	16.50	
Shaft 205	S801483	1-Dec-80	20.00	0.18	Non-combustible hot-cell waste	Cell 9 trash cans 2875,2926 +1000 R/hr contact 135 R/hr at meter	U-235	1.00	0
							Pu239	1.00	
							MFP		
Shaft 205	S801485	1-Dec-80	30.01			Cell 9 trash can 2928,2930 +1000 R/hr contact 170 R/hr at meter	U-235	95.00	0
							Pu-239	25.00	
							MFP		
Shaft 205	S802244	1-Dec-80	15.00	0.18	Non-combustible hot-cell waste	Hotcell 14 fuel & trash cans 2574,2577 160,000 mR/hr at contact	U-235	20.00	0
							Pu-239	0.50	
							MFP		
Shaft 205	S802246	1-Dec-80	16.00		Combustible hot-cell waste	Cell 14 fuel can 2604,2584 surface reading 1,000,000 mR/hr	U-235	70.00	0
							MFP		
							Pu-239	17.50	
Shaft 205	S802247	1-Dec-80	16.00			Cell 14 fuel & trash cans 2603, 2602 surface reading 615,000 mR/hr	U-235	21.00	0
							Pu-239	5.00	
							MFP		
Shaft 205	S802259	1-Dec-80	15.00	0.18	Combustible hot-cell waste	Cell waste cans 2642,2669 cell 9 1000 R/hr plus bottom entry	U-235	39.00	0

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
							Pu-239	12.00	
Shaft 205	S802287	1-Dec-80	20.00		Non-combustible hot-cell waste	Hot trash cell 9 cans 2785,2646 +1000R/hr contact 520 R/hr at one meter	U-235	23.60	0
							MFP		
							Pu-239	57.00	
Shaft 206	S812291	1-Apr-81	10.00	0.21	Combustible hot-cell waste	Cell 13 15 met samples cans 2805 2806 bottom entry 1000+R/hr @ contact	U-235	321.00	0
							MFP		
							Pu-239	123.00	
Shaft 206	S812292	1-Apr-81	10.00			Cell 13,15 met samples cans 2801 2804 bottom entry 1000+R/hr at contact	U-235	269.00	0
							Pu-239	100.00	
							MFP		
Shaft 206	S812293	1-Apr-81	20.00	0.21	Non-combustible hot-cell waste	Cell waste cans 2454 2812 cell 14 1050R/hr contact 108R/hr meter	Pu-239	7.00	0
							U-235	28.00	
							MFP		
Shaft 206	S812297	14-Apr-81	20.00	0.21	Non-combustible hot-cell waste	Cell 14 trash & fuel #2829 2807 +1000R/hr contact 100R/hr at meter	U-235	86.00	0
							Pu-239	22.00	
							MFP		
Shaft 206	S812298	1-Apr-81	20.00	0.21	Non-combustible hot-cell waste	Cell 14 trash & fuel #2826 & 2827 1000R/hr at contact 100R/hr at meter	U-235	86.00	0
							MFP		
							Pu-239	22.00	
Shaft 206	S812302	1-Apr-81	14.00	0.21	Combustible hot-cell waste	Cell 13&9 hot trash cans 2883 2865 1010+R/hr at contact	Pu-239	8.00	0
							MFP		
							U-235	23.00	
Shaft 206	S812303	1-Apr-81	14.00			Cell 13 & 9 hot trash cans 2883 2865 1010+R/hr at contact	U-235	23.00	0
							Pu-239	8.00	
							MFP		

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
Shaft 207	S811397	29-May-81	16.00	0.24	Combustible hot-cell waste	Cell 13 grinding papers kimwipes plastic plastic can nos 3069 and 3055	U-235	0.40	60,000
							MFP		
							Pu-239	0.10	
Shaft 207	S811400	29-May-81	16.00	0.24	Combustible hot-cell waste	Glass paper etc can 3046,6060 cell 14 290,000 mR/nr surface	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 207	S811401	29-May-81	16.00	0.24	Combustible hot-cell waste	Cell 14 can 3065 fuel plastic bottles cell 16 cam 3067,170,000 mR/hr	U-235	4.24	0
							Pu-239	1.06	
							MFP		
Shaft 207	S811406	29-May-81	16.00	0.24	Combustible hot-cell waste	Cell 13 grinding papers kimwipes plastic cans 3103,3101,150,000 mR/a	U-235	0.40	0
							Pu239	0.10	
							MFP		
Shaft 207	S814978	29-May-81	12.00	0.37	Combustible hot-cell waste	Cell 15 wipes, polishing cloths plastic cans 3104,3097,3099-also fpr, 4979	U-235	0.24	3,600
							Pu-239	0.06	
							MFP		
Shaft 208	S810794	22-Jun-81	16.00	0.22	Combustible hot-cell waste	Cell 9 13 fuel trash cans 3123 3126 1000+R/hr contact 100R/hr meter	U-235	101.50	0
							MFP		
							Pu-239	28.50	
Shaft 208	S810802	22-Jun-81	5.00	0.11	Combustible hot-cell waste	Cell 13 hot trash can 3119	U-235	0.40	1,000
							Pu-239	0.10	
							MFP		
Shaft 208	S811405	22-Jun-81	16.00	0.22	Combustible hot-cell waste	Cell 13 catch pans, grinding paper,towel plastic cans 3096 3102	U-235	2.00	80,000
							MFP		
							Pu-239	0.50	
Shaft 208	S811408	22-Jun-81	8.00	0.11	Combustible hot-cell waste	Cell 15 wipbs polishing clothes plastics can 3093	U-235	0.40	1,500

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
							Pu-239	1.61	
Shaft 208	S811409	22-Jun-81	16.00	0.22	Combustible hot-cell waste	Cells 13 catch pans fuel grinding papers plastic cans 3092 3110	U-235	0.40	32,000
							Pu-239	0.10	
							MFP		
Shaft 208	S811411	22-Jun-81	16.00			Cell 13 grinding paper plastic towels plastic cans 3094 3116	U-235	0.40	29,000
							MFP		
							Pu-239	0.10	
Shaft 208	S814979	22-Jun-81	8.00			Cell 15 wipes, polishing cloths plastic cans 3100,3109 - see form S814978	U-235	0.16	2,400
							Pu-239	0.04	
							MFP		
Shaft 209	S810795	22-Jun-81	16.00			Cell 13 trash plastic paint vermiculite plastic cans paint vermiculite	U-235	0.40	15,000
Shaft 209	S810797	22-Jun-81	16.00			Cell 15 trash wipes chips plastic cans 3118 & 3129	U-235	0.40	2,800
							Pu-239	0.10	
							MFP		
Shaft 209	S810798	22-Jun-81	16.00			Cell 15 vermiculite wipes plastic paint plastic cans 3111 3114	U-235	0.40	1,600
							Pu-239	0.10	
							MFP		
Shaft 209	S810799	22-Jun-81	30.01	0.45	Combustible hot-cell waste	Cell 15 trash cans 2125 3108 3117 3130	U-235	0.40	5,000
							Pu-239	0.10	
							MFP		
Shaft 209	S811412	22-Jun-81	16.00	0.22	Combustible hot-cell waste	Cell 13 grinding papers plastic glass plastic cans 3091 3115	U-235	0.40	90,000
							Pu-239	0.10	
							MFP		

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
Shaft 210	S810800	22-Jun-81	0.00			Cell 13,15 hot trash cans 3145,3147	MFP		10,000
							U-235	0.40	
							Pu-239	0.10	
Shaft 210	S810804	22-Jun-81	0.00	0.45	Combustible hot-cell waste	Cell 13,150hot trash cans 3139,3133,3135 cans, 3132	U-235	0.40	4,000
							Pu-239	0.10	
							MFP		
Shaft 210	S810805	22-Jun-81	35.01			Cell 13 15 hot trash cans 3143 3146 2969 3151 in suitcase cask	MFP		5,000
							Pu-239	0.10	
							U-235	0.40	
Shaft 210	S810806	22-Jun-81	16.00	0.22	Combustible hot-cell waste	Cell 13 15 hot trash cans 3150 3153	U-235	0.40	300
							Pu-239	0.10	
							MFP		
Shaft 211	S810807	6-Oct-81	880.15	0.22	Combustible hot-cell waste	Cell 13 & 15 hot trash cans plastic 3145 3147	U-235	0.40	16,000
							MFP		
							Pu-239	0.10	
Shaft 211	S810808	6-Oct-81	880.15	0.22	Combustible hot-cell waste	Cell 14 cans 3158 3159 hot trash glass 126 rat contact plastic paper	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 211	S810809	6-Oct-81	880.15	0.22	Combustible hot-cell waste	Cell 13 trash catch pans, plastic wipes plastic cans 3162 3167 160R/hr @ c	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 211	S810810	6-Oct-81	880.15	0.44	Combustible hot-cell waste	Cell 15 cold trash plastics, bottles wipes can 3160 3161 3168 3169	U-235	0.40	1,000
							Pu-239	0.10	
							MFP		
Shaft 211	S812669	6-Oct-81	880.15	0.22	Combustible hot-cell waste	Cell 14 cans 3178 3179 fuel am glass etc 940R/hr contact	U-235	26.00	0
							Pu-239	6.56	

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
Shaft 212	S803758	9-Apr-80	16002.57	2.10	Non-pn equipment	Lampre reactor vessel sealed in cask vessel in ¼ steel cask with conc	Co-60	0.03	1,750
							Pu-239	200.00	
Shaft 213	S812684	3-Nov-81	16.00	0.21	Non-combustible hot-cell waste	Cell 9 and cell 16 waste and fuel plastic cans 3248 1000+R/hr surf	Pu-239	32.58	0
							MFP		
							U-235	138.00	
Shaft 213	S812686	3-Nov-81	16.00	0.21	Non-combustible hot-cell waste	Cell 14 fuel glass towels cans 3246 3245 500 R at contact	U-235	17.30	0
							Pu-239	4.33	
							MFP		
Shaft 213	S812688	3-Nov-81	16.00	0.21	Non-combustible hot-cell waste	Cell 9 and 13 fuel and hot trash 101,000 mR/hr @ 1m cans 3273/3274	U-235	77.94	0
							Pu-239	12.82	
							MFP		
Shaft 213	S812689	3-Nov-81	16.00			Cell 13 and 14 waste cans 3266 3272 160R/hr @ contact	MFP		0
							Pu-239	0.20	
							U-235	1.00	
Shaft 214	S820057	20-Apr-82	18.00	0.08	Non-combustible hot-cell waste	Cell 16 trash can 3338 wipes, glassware lucite can in steel nipple	U-235	0.40	15,000
							MFP		
							Pu-239	0.10	
Shaft 214	S820058	20-Apr-82	22.00			Cell 16 trash can 3351 lucite can in steel nipple	U-235	0.40	4,000
							Pu-239	0.10	
							MFP		
Shaft 214	S821822	21-Apr-82	30.01	0.17	Non-combustible hot-cell waste	Cell 13 trash can 3369 plastic bags and bottles	U-235	0.40	25,000
							MFP		
							Pu-239	0.10	
Shaft 214	S821823	21-Apr-82	30.01			Cell 13 trash can 3373	U-235	0.40	30,000
							Pu-239	0.10	

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
Shaft 214	S821826	23-Apr-82	25.00	0.17	Non-combustible hot-cell waste	Cell 14 can 3378	U-235	0.40	20,000
							MFP		
							Pu-239	0.10	
Shaft 214	S823410	1-Apr-82	16.00	0.17	Non-combustible hot-cell waste	Cell 13 and 14 cans 3307,3278 110 R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 215	S820041	9-Jun-82	18.00	0.07	Non-combustible hot-cell waste	Cell 9 fuel can 3312 1000+ R/hr contact	U-235	71.26	0
							Pu-239	15.27	
							MFP		
Shaft 215	S820042	9-Jun-82	18.00			Cell 14 waste can 3307 140R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 215	S821832	9-Jun-82	28.01	0.14	Non-combustible hot-cell waste	Cell 11 trash can 3393 lucite can	Pu-239	0.10	35,000
							MFP		
							U-235	0.40	
Shaft 215	S821833	9-Jun-82	28.01			Cell 11 hot trash can 3300 100 R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 215	S821834	9-Jun-82	28.01		Combustible hot-cell waste	Cell 13 hot trash can 3397 200 R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 215	S821835	9-Jun-82	28.01		Non-combustible hot-cell waste	Cell 13 hot trash can 3383	U-235	0.40	40,000
							MFP		
							Pu-239	0.10	
Shaft 215	S821837	9-Jun-82	28.01		Combustible hot-cell waste	Cell 13 hot trash can 3415	U-235	0.40	20,000
							Pu-239	0.10	

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
Shaft 216	S821825	9-Jun-82	20.00	0.14	Non-combustible hot-cell waste	Cell 14 can 3373	U-235	4.00	40,000
							Pu-239	1.00	
							MFP		
Shaft 216	S821836	9-Jun-82	28.01	0.14	Combustible hot-cell waste	Cell 13 hot trash can 3416	U-235	0.40	20,000
							MFP		
							Pu-239	0.10	
Shaft 216	S821838	9-Jun-82	28.01			Cell 13 hot trash can 3395	U-235	0.40	15,000
							Pu-239	0.10	
							MFP		
Shaft 216	S821839	9-Jun-82	28.01			Cell 13 hot trash can 3405	U-235	0.40	8,000
							Pu-239	0.10	
							MFP		
Shaft 216	S821840	9-Jun-82	28.01			Cell 13 hot trash can 3384 200R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 216	S821841	9-Jun-82	28.01			Cell 13 hot trash can 3385	U-235	0.40	30,000
							Pu-239	0.10	
							MFP		
Shaft 217	S821870	13-Sep-82	20.00	0.14	Non-combustible hot-cell waste	Cell 14 can 3451 glass, plastic bottles	U-235	0.40	15,000
							Pu-239	0.10	
							MFP		
Shaft 217	S821871	13-Sep-82	38.01		Combustible hot-cell waste	Cell 14 can 3452 fuel scrap 100000mR/hr at contact	U-235	12.87	0
							Pu-239	3.20	
							MFP		
Shaft 217	S821874	13-Sep-82	28.01	0.14	Combustible hot-cell waste	Cell 13 hot trash grinding papers, etc. Bottom entry cask	U-235	0.40	80,000
							MFP		
							Pu-239	0.10	

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
Shaft 217	S821882	13-Sep-82	30.01		Non-combustible hot-cell waste	Cell 13 trash can 3478	U-235	0.40	6,000
							MFP		
							Pu-239	0.10	
Shaft 217	S821915	13-Sep-82	10.00		Combustible hot-cell waste	Cell 9 can 3446 waste fuel & cell trash 1000+ R/hr contact	U-235	60.00	0
							MFP		
							Pu-239	22.81	
Shaft 217	S821918	13-Sep-82	38.01	0.14	Combustible hot-cell waste	Cell 14 can 3437 fuel scrap card boxes 900R/hr at contact	U-235	12.87	0
							MFP		
							Pu-239	3.20	
Shaft 218	S821875	13-Sep-82	30.01	0.14	Non-combustible hot-cell waste	Cell 9 trash can 3499 300 R @ contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 218	S821879	13-Sep-82	30.01			Cell 13 trash can 3477 500 R/contact	U-235	9.00	0
							MFP		
							Pu-239	2.00	
Shaft 218	S821881	13-Sep-82	30.01			Cell 13 trash can 3468 900R @ contact	U-235	9.00	0
							MFP		
							Pu-239	2.00	
Shaft 218	S821883	13-Sep-82	30.01			Cell 13 trash can 3469 200R/hr at contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 218	S821916	13-Sep-82	40.01			Cropper disposals and fuel can 3489 1000R/hr at contact	U-235	82.80	0
							Pu-239	40.40	
							MFP		
Shaft 218	S821917	13-Sep-82	30.01			Cell 9 trash can 5 300R @ contact	MFP		0
							U-235	0.40	
							Pu-239	0.10	
Shaft 219	S832830	10-Mar-83	30.01	0.14	Non-combustible hot-cell waste	Cell 13 grinding waste can 3527 1000 R/hr @ contact	U-235	0.40	0

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
							Pu-239	0.10	
Shaft 219	S832831	10-Mar-83	30.01			Cell 11 trash can 3727 bottom entry cask	U-235	0.40	30,000
							Pu-239	0.10	
							MFP		
Shaft 219	S832832	10-Mar-83	30.01		Combustible hot-cell waste	Cell 9 fuel and hardware can 3724 1000+R@contact 150R @ 1 meter	U-235	236.10	0
							MFP		
							Pu-239	40.47	
Shaft 219	S832833	10-Mar-83	30.01			Cell 9 waste can 3725 200 R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 219	S832834	10-Mar-83	30.01		Non-combustible hot-cell waste	Cell 9 hot trash can 3524 1000+R contact 50R at 1 meter	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 219	S832835	10-Mar-83	30.01			Cell 9 hot trash can 3495 1000+R contact 100R at 1 meter	U-235	20.18	0
							Pu-239	4.98	
							MFP		
Shaft 220	S832836	10-Mar-83	30.01			Cell 9 waste etc can 3728 100R/hr @ 1 m 1000+R/hr @ con	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 220	S832837	10-Mar-83	30.01			Cell 9 waste can 3491 100R/hr 1 m 1000+R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.11	
Shaft 220	S832838	10-Mar-83	30.01			Cell 11 trash can 3706 100 R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 220	S832839	10-Mar-83	30.01			Cell 13 grinding can 3528 200R/hr contact	U-235	0.40	0
							MFP		

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							Pu-239	0.10	
Shaft 220	S832840	10-Mar-83	30.01		Combustible hot-cell waste	Cell 13 grinding can 3522 200R/hr 1 m 1000+R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 220	S832841	10-Mar-83	30.01			Cell 16 wire wrap can 3726 50 R/hr 1 m 1000+R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 221	S832842	10-Mar-83	30.01			Cell 1 wire wraps 3554 400 R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 221	S832843	10-Mar-83	30.01			Cell 1 wire wraps 3507 1000+ R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 221	S832844	10-Mar-83	30.01			Cell 14 hot trash 3569 800 R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 221	S832845	10-Mar-83	30.01			Cell 14 hot trash can 3722 bottom entry cask	U-235	0.40	60,000
							MFP		
							Pu-239	0.10	
Shaft 221	S832846	10-Mar-83	30.01			Cell 14 waste can 3720 200 R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 221	S832847	10-Mar-83	30.01			Cell 14 waste can 3721 200R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 222	S830716	14-Dec-83	30.01	0.15	Combustible hot-cell waste	Cell 14 can 3712 fuel scrap paper etc. 900 R/hr contact	U-235	2.25	0
							MFP		
							Pu-239	0.56	
Shaft 222	S830717	14-Dec-83	30.01			Cell 14 can 3718 fuel scrap paper etc. 200R/hr 1 meter – 1000R/hr contact	U-235	2.25	0

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
							Pu-239	0.56	
Shaft 222	S830781	14-Dec-83	40.01			Cell 14 trash - 1 can bottom entry can #1	U-36	0.20	20,000
							MFP		
							Pu-53	0.05	
Shaft 222	S830787	14-Dec-83	40.01	0.08	Combustible hot-cell waste	Cell 9 trash - 1 can bottom entry steel can #10 200R/hr	U-36	0.50	0
							Pu-53	0.12	
							MFP		
Shaft 222	S830788	14-Dec-83	40.01	0.15	Combustible hot-cell waste	Cell 14 trash - 1 can bottom entry can #6 100R/hr contact	U-36	0.50	0
							Pu-53	0.12	
							MFP		
Shaft 222	S830789	14-Dec-83	40.01	0.08	Combustible hot-cell waste	Cell 14 trash – 1 can steel can #8	U-36	0.40	10,,000
							MFP		
							Pu-53	0.10	
Shaft 222	S830790	14-Dec-83	40.01			Cell 14 trash - 1 can steel can #9 200 R contact	U-36	11.64	0
							Pu-53	2.91	
							MFP		
Shaft 223	S830782	14-Dec-83	40.01	0.14	Combustible hot-cell waste	Cell 14 trash - 1 can bottom entry can #5 100 R contact	U-36	0.20	0
							Pu-53	0.05	
							MFP		
Shaft 223	S830783	14-Dec-83	40.01			Cell 14 trash - 1 can bottom entry steel can #3	U-36	0.40	25,000
							Pu-53	0.10	
							MFP		
Shaft 223	S830784	14-Dec-83	40.01			Cell 14 trash - 1 can bottom entry steel can #4	U-36	0.40	30,000
							MFP		
							Pu-53	0.10	
Shaft 223	S830785	14-Dec-83	40.01			Cell 14 trash can - 1 can bottom entry steel	U-36	0.40	70,000

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
						can #7			
							Pu-53	0.10	
							MFP		
Shaft 223	S830786	14-Dec-83	40.01			Cell 14 trash - 1 can steel can #2	U-36	0.20	20,000
							MFP		
							Pu-53	0.05	
Shaft 223	S830791	14-Dec-83	40.01			Cell 16 trash - 1 can bottom entry steel can #11	U-36	0.40	32,000
							Pu-53	0.10	
							MFP		
Shaft 224	S852326	30-Dec-85	30.01	0.01	Combustible hot-cell waste	Cell 11 waste - plastic can 4088 300 R/hr contact - steel can 58	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 224	S852328	30-Dec-85	30.01			Cell 11 waste - plastic can 4097 100 R/hr contact - steel can 61	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 224	S852332	30-Dec-85	30.01			Cell 13 waste, plastic can 4072 300 R/hr contact - steel can 32	Pu-239	0.10	0
							MFP		
							U-235	0.40	
Shaft 224	S852804	30-Dec-85	30.01			Cell 14 trash can 3660 - fuel inside steel can 67 - 100 R/hr contact	U-235	8.70	0
							Pu-239	3.30	
							MFP		
Shaft 224	S855064	30-Dec-85	30.01			Cell 14 trash can 3661 - fuel inside steel can 63 - 100 R/hr contact	Pu-239	3.60	0
							MFP		
							U-235	14.90	
Shaft 224	S855065	30-Dec-85	30.01			Cell 14 trash, plastic can 3662, fuel steel can 66 - 300 R/hr contact	U-235	14.90	0
							MFP		
							Pu-239	3.60	

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
Shaft 224	S855066	30-Dec-85	30.01			Cell 14 trash can 3663 - trash only steel can 65	U-235	0.40	70,000
							MFP		
							Pu-239	0.10	
Shaft 224	S855068	30-Dec-85	30.01			Cell 14 trash can 3664 - fuel inside steel can 64	U-235	0.40	20,000
							MFP		
							Pu-239	0.10	
Shaft 225	S840848	31-Dec-84	30.01	0.01	Combustible hot-cell waste	Cell 13 waste - plastic can 4076 steel can 21	U-235	0.40	40,000
							Pu-239	0.10	
							MFP		
Shaft 225	S840854	31-Dec-84	30.01			Cell 13 waste - plastic can 4033 steel can 24	U-235	0.40	50,000
							MFP		
							Pu-239	0.10	
Shaft 225	S840856	31-Dec-84	30.01			Cell 13 waste - plastic can 4043 steel can 31	U-235	0.40	90,000
							Pu-239	0.10	
							MFP		
Shaft 225	S840857	31-Dec-84	30.01			Cell 13 waste - plastic can 4035 105 R/hr contact - steel can 30	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 225	S840863	31-Dec-84	30.01			Cell 13 waste - plastic can 4046 steel can 40	U-235	0.40	10,000
							Pu-239	0.10	
							MFP		
Shaft 225	S840864	31-Dec-84	30.01			Cell 13 waste - plastic can 4044 steel can 34	U-235	0.40	25,000
							Pu-239	0.10	
							MFP		
Shaft 225	S840867	31-Dec-84	30.01			Cell 13 waste - plastic can 4054 steel can 38	U-235	0.40	30,000
							Pu-239	0.10	
							MFP		
Shaft 225	S840874	31-Dec-84	30.01			Cell 14 trash can 4051 steel can 43	U-235	0.40	15,000
							Pu-239	0.10	

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
Shaft 226	S840842	31-Dec-84	30.01			Cell 13 waste - plastic can 4056 steel can 20	U-235	0.40	90,000
							Pu-239	0.10	
							MFP		
Shaft 226	S840843	31-Dec-84	30.01			Cell 13 waste - plastic can 4045 steel can 26	U-235	0.40	80,000
							Pu-239	0.10	
							MFP		
Shaft 226	S840844	31-Dec-84	30.01			Cell 13 waste - plastic can 4023 steel can 19	U-235	0.40	70,000
							Pu-239	0.10	
							MFP		
Shaft 226	S840845	31-Dec-84	30.01			Cell 13 waste - plastic can 4034 steel can 22	U-235	0.40	21,000
							Pu-239	0.10	
							MFP		
Shaft 226	S840846	31-Dec-84	30.01			Cell 13 waste - plastic can 4024 300 R/hr contact - steel can 25	MFP		0
							Pu-239	0.10	
							U-235	0.40	
Shaft 226	S840847	31-Dec-84	30.00			Cell 13 waste - plastic can 4022 steel can 23	U-235	0.40	70,000
							MFP		
							Pu-239	0.10	
Shaft 226	S840862	31-Dec-84	30.01			Cell 13 waste - plastic can 4027 steel can 39	U-235	0.40	15,000
							Pu-239	0.10	
							MFP		
Shaft 226	S840868	31-Dec-84	30.01			Cell 13 waste - plastic can 4025 steel can 35	U-235	0.40	35,000
							Pu-239	0.10	
							MFP		
Shaft 227	S840877	31-Dec-84	30.01			Cell 14 trash can 4050 - fuel inside steel can 42	U-235	8.90	80,000
							Pu-239	2.20	
							MFP		
Shaft 227	S840878	31-Dec-84	30.01			Cell 14 trash can 4042 - fuel inside 250 R/hr contact - steel can 46	U-235	14.40	0
							MFP		

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							Pu-239	3.10	
Shaft 227	S840879	31-Dec-84	30.01			Cell 14 trash can 4041 - fuel inside 300 R/hr contact - steel can 44	U-235	14.40	0
							MFP		
							Pu-239	3.10	
Shaft 227	S840880	31-Dec-84	30.01			Cell 14 trash can 4048 - fuel inside steel can 45 - 350 R/hr contact	U-235	14.40	0
							MFP		
							Pu-239	3.10	
Shaft 227	S840881	31-Dec-84	30.01			Cell 14 trash can 4057 - fuel inside 200 R/hr contact - steel can 51	U-235	14.40	0
							MFP		
							Pu-239	3.10	
Shaft 227	S840883	31-Dec-84	30.01			Cell 14 trash can 4064 100 R/hr contact - steel can 48	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 227	S840885	31-Dec-84	30.01			Cell 14 trash can 4156 - fuel inside contact 400 R/hr - steel can 49	U-235	10.60	0
							Pu-239	3.20	
							MFP		
Shaft 227	S840886	31-Dec-84	30.01			Cell 14 trash can 4084 steel can 50	U-235	0.40	15,000
							Pu-239	0.10	
							MFP		
Shaft 228	S874123	23-Dec-87	30.01	0.00	Combustible hot-cell waste	Cell 14 trash can 4032 steel can 54 - was RSWD S852802	U-235	0.40	9,000
							Pu-239	0.10	
							MFP		
Shaft 228	S874124	23-Dec-87	25.00			Cell 13 waste plastic can 4093 - steel can 35 - 20 R/hr - was RSWD S852325	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 228	S874125	23-Dec-87	30.01			Cell 14 waste can 4164 steel can 62 10 R/hr cont - was RSWD S852811	U-235	0.40	0

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							Pu-239	0.10	
							MFP		
Shaft 228	S874126	23-Dec-87	30.01			Cell 13 waste plastic can 4086 steel can 57 - 200 R/hr - was RSWD S852323	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 228	S874127	23-Dec-87	30.01			Cell 13 waste plastic can 4094 steel can 56 - was RSWD S852324	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 228	S874128	23-Dec-87	30.01			Cell 11 waste plastic can 4092 steel can 60 - was RSWD S852330	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 228	S874129	23-Dec-87	30.01			Cell 11 waste plastic can 4085 steel can 59 - was RSWD S852329	MFP		60,000
							Pu-239	0.10	
							U-235	0.40	
Shaft 228	S874130	23-Dec-87	30.01			Cell 14 trash can 4053 - steel can 53 was RSWD S852803	U-235	0.40	80,000
							Pu-239	0.10	
							MFP		
Shaft 229	S840851	31-Dec-84	30.01	0.02	Combustible hot-cell waste	Cell 13 waste - plastic can 4028 200R/hr contact – steel can 28	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 229	S840855	31-Dec-84	30.01			Cell 13 waste - plastic can 4145 steel can 27	U-235	0.40	40,000
							MFP		
							Pu-239	0.10	
Shaft 229	S840860	31-Dec-84	30.01			Cell 13 waste - plastic can 4026 150 R/hr contact - steel can 36	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 229	S840865	31-Dec-84	30.01			Cell 13 waste - plastic can 4055 steel can 37	U-235	0.40	10,000

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
							Pu-239	0.10	
Shaft 229	S840873	31-Dec-84	30.01			Cell 14 trash can 4065 100 R/hr contact - steel can 41	U-235	12.00	0
							MFP		
							Pu-239	3.00	
Shaft 229	S840882	31-Dec-84	30.01			Cell 14 trash can 4066 steel can 47 - 4.1 ft3 shaft	U-235	0.40	18,000
							MFP		
							Pu-239	0.10	
Shaft 229	S840888	31-Dec-84	30.01			Cell 14 trash can 4075 steel can 52	U-235	0.40	10,000
							Pu-239	0.10	
							MFP		
Shaft 230	S840831	31-Dec-84	30.01	0.01	Non-combustible hot-cell waste	Cell 9 hot waste can 4017 - steel can 13 1000+ R/hr contact/35 R/hr 1 meter	U-235	245.00	0
							Pu-239	96.00	
							MFP		
Shaft 230	S840835	31-Dec-84	30.01		Combustible hot-cell waste	Cell 13 waste - plastic can 4153 100 R/hr contact - steel can 16	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 230	S840836	31-Dec-84	30.01			Cell 13 waste - plastic can 3974 steel can 15	U-235	0.40	30,000
							MFP		
							Pu-239	0.10	
Shaft 230	S840838	31-Dec-84	30.01			Cell 13 waste - plastic can 4154 400 R/hr contact - steel can 14	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 230	S840839	31-Dec-84	30.01			Cell 13 waste - plastic can 4155 steel can 18	U-235	0.40	90,000
							MFP		
							Pu-239	0.10	
Shaft 230	S840840	31-Dec-84	30.01			Cell 13 waste - plastic can 4037 steel can 29	U-235	0.40	90,000
							Pu-239	0.10	

80% DRAFT

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
							MFP		
Shaft 230	S840841	31-Dec-84	30.01			cell 13 waste - plastic can 4036 steel can 17	U-235	0.40	60,000
							Pu-239	0.10	
							MFP		
Shaft 230	S840859	31-Dec-84	30.01			cell 13 waste - plastic can 4031 steel can 33	U-235	0.40	40,000
							MFP		
							Pu-239	0.10	
Shaft 231	S855046	30-Dec-85	30.01	0.01	Combustible hot-cell waste	Plastic can 3813 - vacuum cleaner motor steel can 72 - 1000+R/hr contact	U-235	0.40	0
							MFP		
							Pu-239	0.10	
Shaft 231	S855047	30-Dec-85	25.00			plastic can 4114 - manipulator boot steel can 73 - 1000+ R/hr contact	U-235	0.30	0
							MFP		
							Pu-239	0.10	
Shaft 231	S855048	30-Dec-85	30.01			Cell 10 trash - plastic can 3859 steel can 74 - 100 R/hr contact	U-235	15.00	0
							MFP		
Shaft 231	S855049	30-Dec-85	30.01			Plastic can 3651 - rb robinson fuel steel can 75 - 3 R/hr contact	U-235	9.00	0
							MFP		
Shaft 231	S856015	30-Dec-85	30.01			Plastic can 3649 steel can 68 - 1000+ R/hr contact	U-235	0.40	0
							Pu-239	0.10	
							MFP		
Shaft 231	S856016	30-Dec-85	30.01			Cells 2/4 waste, plastic can 4113 steel can 69 - 20 R/hr contact	U-235	0.30	20,000
							MFP		
							Pu-239	0.10	
Shaft 231	S856017	30-Dec-85	30.01			Plastic can 3626 cell 9 trash steel can 71 - 500 R/hr contact	U-235	0.30	0
							MFP		
							Pu-239	0.10	
Shaft 231	S856018	30-Dec-85	30.01			Plastic #3625 cell 9 trash steel can #70 - 350	U-235	0.40	0

Appendix A-2 – Information from the TRU Waste Database for Lined Shafts

Location	Package ID	Received Date	Gross Weight	Volume (m3)	Waste description	Comments	Radio-nuclides	Total Grams	Total Dose
						R/hr contact			
							Pu-239	0.10	
							MFP		
Shaft 232	S874132	23-Dec-87	35.01	0.00	Combustible hot-cell waste	3 mile island waste can 77 - was on a cwsr la86110050600	U-25	7.00	6,500
							MFP		
							Pu-239	0.00	
Shaft 232	S874133	23-Dec-87	35.01			Cell 9 waste fuel can 79 - was on a cwsr la86110050601 >1000 R/hr	U-238	60.20	0
							Pu-56	12.00	
							Pu-53	16.00	
							Pu-55	27.00	
							Pu-57	13.00	
							U-235	134.80	
Shaft 232	S874134	23-Dec-87	35.01			Inc11 waste steel can 78 - was on a cwsr la86110050648	MFP		29,000
							U-21	48.00	
							Pu-57	1.00	

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
200	S811387	4/14/1981	16	lb	7.3	ft^3	Cell 14 fuel can #3021 #3008 Cell 13	140 R at contact	Pu-239	2.02E+01	g		2,500
									U-235	8.08E+00	g		
									MFP	2.50E+00	Ci		
200	S811390	4/14/1981	16	lb	7.3	ft^3	Cell #14 fuel cans #3010 & 3016	800 R at contact	Pu-239	1.00E+01	g		6,000
									U-235	3.80E+01	g		
									MFP	6.00E+00	Ci		
200	S811396	4/14/1981	16	lb	7.3	ft^3	Cell 13 grinding papers, kimwipes, plastic	Plastic cans 3061, 3053	Pu-239	1.00E-01	g	60,000	600
									U-235	4.00E-01	g		
									MFP	6.00E-01	Ci		
200	S811398	4/14/1981	20	lb	7.3	ft^3	Cell 13 catch & drain pans, kimwipes	120,000 mR/hr surface, cans 3051 & 3052	Pu-239	4.00E+00	g	120,000	600
									U-235	1.60E+01	g		
									MFP	6.00E-01	Ci		
200	S811471	4/14/1981	9	lb	7.3	ft^3	Cell 14 trash cans 2864, 2846	700 R/hr at contact	Pu-239	1.25E+01	g		9,000
									U-235	2.15E+01	g		
									MFP	2.70E+00	Ci		
200	S811473	4/14/1981	16	lb	7.3	ft^3	Cell 14 trash - fuel cans #2877 - 2863	1150 R/hr at contact	Pu-239	5.00E+00	g		20,000
									U-235	4.90E+01	g		
									MFP	2.00E+01	Ci		
201	S791484	6/29/1979			3.2	ft^3	Cell #12 one fuel can #2171	Tin can in plastic container	Pu-239	3.00E+00	g	17,500	4,000
									U-235	1.00E+00	g		
									MFP	4.00E+00	Ci		
201	S794215	6/29/1979	15	lb	5.7	ft^3	Cell 12 trash & fuel #1854, 1851	266000 mr at contact	Pu-239	5.50E-01	g	266,000	11,000
									U-235	2.00E+00	g		
									MFP	1.10E+01	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
201	S794216	6/29/1979	15	lb	5.7	ft^3	Cell 12 trash and fuel can #1798 & 1953	261000 mr/hr at contact, cans in p-bags	Pu-239	2.25E+00	g	261,000	85,000
									U-235	9.00E+00	g		
									MFP	8.00E+00	Ci		
201	S794218	6/29/1979	10	lb	5.7	ft^3	Cell 14 fuel can no. 2002 & 2003	tin cans in plastic cans in p-bags	Pu-239	2.50E+00	g	15,000	1,000
									U-235	1.00E+01	g		
									MFP	1.00E+00	Ci		
201	S794219	6/29/1979	12	lb	5.7	ft^3	Cell 14 fuel & trash can no. 2004 & 1992	Tin cans in plastic cans in p-bags	Pu-239	1.50E+00	g	27,000	1,300
									U-235	5.00E+00	g		
									MFP	1.30E+00	Ci		
201	S794220	6/29/1979	6	lb	5.7	ft^3	Hot trash met samples cans 1and 4A	1200 R/hr at contact	Pu-239	6.80E+01	g		30,000
									U-235	1.47E+02	g		
									MFP	3.00E+01	Ci		
201	S794221	6/29/1979	8	lb	5.7	ft^3	Fuel samples from cells 13, 15, cans 2 & 3A	1050 R/hr at contact	Pu-239	1.40E+02	g		35,000
									U-235	3.70E+02	g		
									MFP	3.50E+01	Ci		
202	S803548	4/30/1980	2.3	ton	44	ft^3	Hot cell waste CMB1 - CMB14 from 9/15/79	thru 1/10/80	Pu-239	6.54E+01	g		
									U-235	2.23E+02	g		
									MFP	2.15E+02	Ci		
203	S803547	4/30/1980	2.3	ton	44	ft^3	Hot cell waste CMB1 - CMB14 from 12/13/	78 thru 8/15/79	Pu-239	3.75E+01	g		
									U-235	1.27E+02	g		
									MFP	1.09E+02	Ci		
204	S791472	6/29/1979	20	lb	7.5	ft^3	Cell 12 trash & fuel cans 2127 & 2150	108000 Mr at contact	Pu-239	1.75E+00	g	108,000	10,500
									U-235	5.25E+00	g		
									MFP	1.05E+01	Ci		
204	S791478	6/29/1979	15	lb	7.5	ft^3	Cell 9 hot trash cans 2015, 2117, 1000+Rhr	at contact 140000 mR/hr at meter	Pu-239	3.50E+01	g		

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									U-235	1.21E+02	g		
									MFP				
204	S791483	6/29/1979	15	lb	7.5	ft^3	Cell 12 fuel cans 2095 & 2167	tin cans in plastic cans	Pu-239	1.50E+00	g	50,000	15,000
									U-235	4.50E+00	g		
									MFP	1.5E+???	Ci		
204	S794222	6/29/1979	16	lb	7.5	ft^3	Cell 12 fuel cans #1790 & 1815	100000 R at 1 meter	Pu-239	4.75E+00	g		
									U-235	1.90E+01	g		
									MFP				
204	S794223	6/29/1979	20	lb	7.5	ft^3	Cell 9 trash in 1 gal. disposable cans	in plastic bag, can #s 1786 & 1813	Pu-239	1.65E+01	g		20,400
									U-235	4.38E+01	g		
									MFP	2.00E+01	Ci		
205	S801483	12/1/1980	20	lb	6.3	ft^3	Cell 9 trash cans 2875, 2926	+1000 R/hr contact 135 R/hr at meter	Pu-239	1.00E-01	g		
									U-235	1.00E-01	g		
									MFP	1.35E+02	Ci		
205	S801485	12/1/1980	30	lb	6.3	ft^3	Cell 9 trash can 2928, 2930	+1000R/hr contact 170 R/hr at meter	Pu-239	2.50E+01	g		
									U-235	9.50E+01	g		
									MFP	1.70E+02	Ci		
205	S802244	12/1/1980	15	lb	6.3	ft^3	Cell 14 fuel & trash cans 2574 & 2577	160000 mR/hr at contact	Pu-239	5.00E-01	g	160,000	41,000
									U-235	2.00E+01	g		
									MFP	4.10E+00	Ci		
205	S??2246	12/1/1980	16	lb	6.3	ft^3	Cell 14 fuel can # 2604 & 2584	surface reading 1,000,000 mR/hr	Pu-239	1.75E+01	g	1,000,000	14,000
									U-235	7.00E+01	g		
									MFP	1.40E+00	Ci		
205	S??2247	12/1/1980	16	lb	6.3	ft^3	Cell 14 fuel & trash can # 2603 & 2602	surface reading 615000 mR/hr	Pu-239	5.00E+00	g	615,000	12,000
									U-235	2.10E+01	g		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									MFP	1.20E+00	g		
205	S802259	12/1/1980	15	lb	6.3	?	Cell waste cans 2642, 2669, Cell 9	1000 R hr plus bottom entry	Pu-239	1.20E+01	g		35,000
									U-235	3.90E+01	g		
									MFP	3.50E+01	Ci		
205	S802287	12/1/1980	20	lb	6.3	ft^3	Hot trash cell 9 cans 2785, 2646 +1000 Rhr	contact 520 Rhr at one meter	Pu-239	5.70E+01	g		
									U-235	2.36E+02	g		
									MFP	5.20E+02	Ci		
206	S812291	4/1/1981	10	lb	7.3	ft^3	Cell 13, 15 met samples, cans 2805, 2806	Bottom entry 1000+ R/hr @ contact	Pu-239	1.23E+02	g		40,000
									U-235	3.21E+02	g		
									MFP	4.00E+01	Ci		
206	S812292	4/1/1981	10	lb	7.3	ft^3	Cell 13, 15 met samples cans 2801, 2804	Bottom entry 1000+ R/hr @ contact	Pu-239	1.00E+02	g		22,000
									U-235	2.69E+02	g		
									MFP	2.20E+01	Ci		
206	S812293	4/1/1981	20	lb	7.3	ft^3	Cell waste cans 2454, 2812, cell 14	1000 Rhr contact, 108 Rhr meter	Pu-239	7.00E+00	g		
									U-235	2.80E+01	g		
									MFP	1.00E+02	Ci		
206	S812297	4/14/1981	20	lb	7.3	ft^3	Cell 14 trash & fuel #2829, 2807	+1000 Rhr contact 100 Rhr at meter	Pu-239	2.20E+01	g		
									U-235	?.6E+01	g		
									MFP	1.00E+02	Ci		
206	S812298	4/1/1981	20	lb	7.3	ft^3	Cell #14 trash & fuel #2826 & 2827	+1000 Rhr at contact 100 Rhr at meter	Pu-239	2.20E+01	g		
									U-235	8.60E+01	g		
									MFP	1.00E+02	Ci		
206	S812302	4/1/1981	14	lb	7.3	ft^3	Cell 13 & 9 hot trash cans 2883, 2865	1010+ R/hr @ contact	Pu-239	8.00E+00	g		82,000
									U-235	2.30E+01	g		
									MFP	8.20E+00	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
207	S811397	5/29/1981	16	lb	8.6	ft^3	Cell 13 grinding papers, kimwipes, plastic	Plastic can nos. 3069 and 3055	Pu-239	1.00E-01	g	60,000	2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
207	S811400	5/29/1981	16	lb	8.6	ft^3	glass, paper, etc, can 3046, 3060, Cell 14	290000 mR/hr surface	Pu-239	1.00E-01	g	290,000	3,500
									U-235	4.00E-01	g		
									MFP	3.50E+00	Ci		
207	S811401	5/29/1981	16	lb	8.6	ft^3	Cell 14 can 3065? Fuel plastic bottles	Cell 16 can 3067 170000 mR/hr	Pu-239	1.06E+00	g	170,000	5,150
									U-235	4.24E+00	g		
									MFP	5.15E+00	Ci		
207	S811406	5/29/1981	16	lb	8.6	ft^3	Cell 13 (illegible) Papers, kimwipes, plastic	Plastic cans 3103, 3101, 150000 mR/hr	Pu-239	1.00E-01	g	150,000	2,500
									U-235	4.00E-01	g		
									MFP	2.50E+00	Ci		
207	S814978	5/29/1981	12	lb	13.1?	ft^3	Cell 15 wipes, polishing cloths, plastic	cans 3104, 3097, 3099 - also form 4979	Pu-239	6.00E-02	g	3,600	180
									U-235	2.40E-01	g		
									MFP	1.80E-01	Ci		
208	S810734?	6/22/1981	16	lb	7.9	ft^3	Cell 9, 13 fuel trash cans 3123, 3126	1000+ R/hr contact 100 R/hr meter	Pu-239	2.85E+01?	g		
									U-235	1.02E+02	g		
									MFP	???E+02	Ci		
208	S810802	6/22/1981	5	lb	3.9	ft^3	Cell 13 hot trash can 3119		Pu-239	1.00E-01	g	1,000	60
									U-235	4.00E-01	g		
									MFP	6.00E-02	Ci		
208	S811405	6/22/1981	16	lb	7.9	ft^3	Cell 13 catch pans, grinding papers, towels	plastic cans 3096, 3102	Pu-239	5.00E-01	g	80,000	2,000
									U-235	2.00E+00	g		
									MFP	2.00E+00	Ci		

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
208	S811408	6/22/1981	8?	lb	3.9	ft^3	Cell 15 wipes, polishing cloths, plastics	Can 3093	Pu-239	1.00E-01	g	1,500	80
									U-235	4.00E-01	g		
									MFP	9.0?E-02	Ci		
208	S811409	6/22/1981	16	lb	7.9	ft^3	Cell 13 catch pans, fuel, grinding papers	plastic cans 3092, 3110	Pu-239	1.00E-01	g	32,000	2,100
									U-235	4.00E-01	g		
									MFP	2.10E+00	Ci		
208	S811411	6/22/1981	16	lb	7.9	ft^3	Cell 13 grinding papers, plastic, towels	Plastic cans 3094, 3116	Pu-239	1.00E-01	g	29,000	1,000
									U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
208	S814979	6/22/1981	8	lb	7.9	ft^3	Cell 15 wipes, polishing cloths, plastic	Cans 3100, 3109 - see form S814978	Pu-239	4.00E-02	g	2,400	120
									U-235	1.60E-01	g		
									MFP	1.20E-01	Ci		
209	S810795	6/22/1981	16	lb	7.9	ft^3	Cell 13 trash, plastic, paint, vermiculite	Plastic cans 3098, 3131	Pu-239	1.00E-01	g	15,000	1,000
									U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
209	S810787?	6/22/1981	16	lb	7.9	ft^3	Cell 15 trash, wipes, chips, plastic	Plastic cans 3118 & 3129	Pu-239	1.00E-01	g	2,800	400
									U-235	4.00E-01	g		
									MFP	4.00E-01	Ci		
209	S810798	6/22/1981	16	lb	7.9	ft^3	Cell 15 vermiculite, wipes, plastic, paint	Plastic cans 3111, 3114	Pu-239	1.00E-01	g	1,600	200
									U-235	4.00E-01	g		
									MFP	2.00E-01	Ci		
209	S810799	6/22/1981	30	lb	15.8	ft^3	Cell 15 trash cans 2125, 3108, 3117, 3130		Pu-239	1.00E-01	g	5,000	300
									U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
209	S811412	6/22/1981	16	lb	7.9	ft^3	Cell 13 grinding papers, plastic, glass	Plastic cans 3091, 3115	Pu-239	1.00E-01	g	90,000	2,000

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
210	S810800	6/22/1981			7.9	ft^3	Cell 13, 15 hot trash cans 3145, 3147		Pu-239	1.00E-01	g	10,000	400
									U-235	4.00E-01	g		
									MFP	4.00E-01	Ci		
210	S810804	6/22/1981			15.8?	ft^3	Cell 13, 15 hot trash cans 3139, 3133, 3135	Cans, 3132	Pu-239	1.00E-01	g	4,000	200
									U-235	4.00E-01	g		
									MFP	2.00E-01	Ci		
210	S810805	6/22/1981	35	lb	15.8	ft^3	Cell 13, 15 hot trash cans 3143, 3146, 2969	3151 in suitcase cask	Pu-239	1.00E-01	g	5,000	300
									U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
210	S810806	6/22/1981	16	lb	7.9	ft^3	Cell 13, 15 hot trash cans 3150, 3153		Pu-239	1.00E-01	g	300	20
									U-235	4.00E-01	g		
									MFP	2.00E-02	Ci		
211	S810807	6/23/1981	880	lb	7.9	ft^3	Cell 13 & 15 hot trash	cans plastic 3145, 3147	Pu-239	1.00E-01	g	16,000	700
		10/6/1981							U-235	4.00E-01	g		
									MFP	7.00E-01	Ci		
211?	S810808	10/6/1981	880	lb	7.9	ft^3	Cell 14 cans 3158, 3159, hot trash, glass	126 R at contact, plastic, paper	Pu-239	1.00E-01	g		2,200
									U-235	4.00E-01	g		
									MFP	2.20E+00	Ci		
211?	S810809	10/6/1981	880	lb	7.9	ft^3	Cell 13 trash catch pans, plastic wipes	Plastic cans 3162, 3167, 160 R/hr @ ct.	Pu-239	1.00E-01	g		4,000
									U-235	4.00E-01	g		
									MFP	4.00E+00	Ci		
211?	S810810	10/6/1981	880	lb	15.7	ft^3	Cell 15 cold trash, plastics, bottles, wipes	Can 3160, 3161, 3168, 3169	Pu-239	1.00E-01	g	1,000	60
									U-235	4.00E-01	g		
									MFP	6.00E-02	Ci		
211	S812669	10/6/1981	880	lb	7.9	ft^3	Cell 14 cans 3171?, 3179, fuel , OM?, glass,	940 Rhr contact	Pu-239	6.56E+00	g		11,000

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
							etc						
		8/3/1981							U-235	2.60E+01	g		
									MFP	1.10E+01	Ci		
212	S803758	4/9/1980	8	ton	75	ft^3	LAMPRE reactor vessel sealed in cask	Vessel in 1/4" steel cask with concre	Pu-239	2.00E+02	g	1,750	300
									Co-60	3.00E+01	Ci		
213	S812684	11/3/1981	16	lb	7.5	ft^3	Cell 9 cell waste & fuel & cell 16 waste	Plastic cans 3248 - 1000+ R/hr surf.	Pu-239	3.26E+01	g		40,800
									U-235	1.38E+02	g		
									MFP	4.08E+01	Ci		
213	S812686	11/3/1981	16	lb	7.5	ft^3	Cell 14 cans 3245, 3246, fuel, glass, towels	500 R at contact	Pu-239	4.33E+00	g		7,000
									U-235	1.73E+01	g		
									MFP	7.00E+00	Ci		
213	S812688	11/3/1981	16	lb	7.5	ft^3	Cell 9 & 13 fuel & hot trash	101000 mR/hr @ 1 meter, Cans 3273/3274	Pu-239	1.28E+01	g		101,000
									U-235	7.79E+01	g		
									MFP	1.01E+02	Ci		
213	S812689	11/3/1981	16	lb	7.5	ft^3	Cell 13 14 cell waste cans 3266, 3272	160 R/hr @ contact	Pu-239	2.00E-01	g		2,800
									U-235	1.00E+01	g		
									MFP	2.80E+00	Ci		
214	S820057	4/20/1982	18	lb	3	ft^3	Cell 16 trash can 3338, kimwipes, glassware	Lucite can in steel nipple	Pu-239	1.00E-01	g	15,000	300
									U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
214	S820058	4/20/1982	22	lb	3	ft^3	Cell 16 trash can 3351, kimwipes, glassware	Lucite can in steel nipple	Pu-239	1.00E-01	g	4,000	120
									U-235	4.00E-01	g		
									MFP	1.20E-01	Ci		
214	S821822	4/21/1982	30	lb	6	ft^3	Cell 13 trash can 3369, kimwipes, paper	Plastic bags & bottles	Pu-239	1.00E-01	g	25,000	400
									U-235	4.00E-01	g		

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									MFP	4.00E-01	Ci		
214	S821823	4/21/1982	30	lb	8	ft^3	Cell 13 trash can 3373, paper, plastic		Pu-239	1.00E-01	g	30,000	450
									U-235	4.00E-01	g		
									MFP	4.50E-01	Ci		
214	S821826	4/23/1982	20?	lb	6.0?	ft^3	Cell 14 can 3378, glass, plastic bottles		Pu-239	1.00E-01	g	20,000	400
									U-235	4.00E-01	g		
									MFP	4.00E-01	Ci		
214	S823410	4/1/1982	16	lb	6	ft^3	Cell 13 & Cell 14 hot trash cans 3307 &	110 R/hr @ contact, can 3278	Pu-239	1.00E-01	g		1,300
									U-235	4.00E-01	g		
									MFP	1.30E+00	Ci		
215	S820041	6/9/1982	18	lb	2.5	Gal.	Cell 9 fuel can 3312	1000+ Rhr at contact	Pu-239	1.50E+01	g		30,000
		1/6/1982							U-235	7.12E+01	g		
									MFP	3.00E+01	Ci		
215	S820042	6/9/1982	18	lb	2.5	ft^3	Cell 14 waste can 3307	140 R/hr @ contact	Pu-239	1.00E-01	g		15,000
		1/6/1982							U-235	4.00E-01	g		
									MFP	1.50E+01	Ci		
215	S821832	6/9/1982	28	lb	5	ft^3	Cell 11 trash can 3393 hot trash	Lucite can in steel nipple	Pu-239	1.00E-01	g	35,000	2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
215	S821833	6/9/1982	28	lb	5	ft^3	Cell 11 hot trash can 3300	100R @ contact	Pu-239	1.00E-01	g		3,000
									U-235	4.00E-01	g		
									MFP	3.00E+00	Ci		
215	S821834	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3387?	200 R/hr @ contact	Pu-239	1.00E-01	g		2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
215	S821835	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3383	Grinding papers, kim wipes	Pu-239	1.00E-01	g	40,000	800
									U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
215	S821837	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3415	Bottles, kimwipes	Pu-239	1.00E-01	g	20,000	2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
216	S821825	6/9/1982	20	lb	5	ft^3	Cell 14 can 3373, glass, towels, plstic, etc		Pu-239	1.00E+00	g	40,000	800
									U-235	4.00E+00	g		
									MFP	8.00E-01	Ci		
216	S821836	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3416	Bottles, kimwipes	Pu-239	1.00E-01	g	20,000	2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
216	S821838	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can# 3395, grinding, etc	Kimwipes, plastic	Pu-239	1.00E-01	g	15,000	1,000
									U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
216	S821839	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3405	Vermiculite wipes	Pu-239	1.00E-01	g	8,000	200
									U-235	4.00E-01	g		
									MFP	2.00E-01	Ci		
216	S821840	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3384	200 R/hr @ contact	Pu-239	1.00E-01	g		4,000
									U-235	4.00E-01	g		
									MFP	4.00E+00	Ci		
216	S821841	6/9/1982	28	lb	5	ft^3	Cell 13 hot trash can 3385, kimwipes	Grinding papers	Pu-239	1.00E-01	g	30,000	2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
217	S821870	9/13/1982	20	lb	5	ft^3	Cell 14 can 3451, glass, plastic bottles		Pu-239	1.00E-01	g	15,000	1,500
									U-235	4.00E-01	g		
									MFP	1.80E-01	Ci		
217	S821871	9/13/1982	38	lb	5	ft^3	Cell 14 can 3452, fuels scrap, card boxes	100000 mR/hr at contact	Pu-239	3.20E+00	g	100,000	4,500
									U-235	1.29E+01	g		

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									MFP	4.50E+00	Ci		
217	S821874	9/13/1982	28	lb	5	ft^3	Cell 13 hot trash, grinding papers, etc	Bottom entry cask	Pu-239	1.00E-01	g	80,000	1,000
									U-235	4.00E-01	g		
									MFP	1.00E+01	Ci		
217	S821882	9/13/1982	30	lb	5	ft^3	Cell 13 trash can # 3478		Pu-239	1.00E-01	g	6,000	1,000
									U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
217	S821915	9/13/1982	10	lb	5	ft^3	Cell 9 can 3446, waste fuel and cel trash	1000+ R contact 150 R at 1 meter	Pu-239	2.28E+01	g		1,000
									U-235	6.00E+01	g		
									MFP	1.00E+00	Ci		
217	S821918	9/13/1982	38	lb	5	ft^3	Cell 14 can 3437 fuel scrap card boxes	900 R/hr @ cont	Pu-239	3.20E+00	g		10,000
									U-235	1.29E+01	g		
									MFP	1.00E+00	Ci		
218	S821875	9/13/1982	30	lb	5	ft^3	Cell 9 trash can # 3499	300 R @ contact	Pu-239	1.00E-01	g		20,000
									U-235	4.00E-01	g		
									MFP	2.00E+01	Ci		
218	S821879	9/13/1982	30	lb	5	ft^3	Cell 13 trash catch pan can# 3477	500 R @ contact	Pu-239	2.00E+00	g		30,000
									U-235	9.00E+00	g		
									MFP	3.00E+01	Ci		
218	S821881	9/13/1982	30	lbs	1	ft^3	Cell 13 trash can #3468	900 R @ contact	Pu-239	2.00E+00	g		40,000
									U-235	9.00E+00	g		
									MFP	4.00E+01	Ci		
218	S821883	9/13/1982	30	lb	5	ft^3	Cell 13 trash can # 3469	200 Rhr@ contact	Pu-239	1.00E-01			6,000
									U-235	4.00E-01			
									MFP	6.00E+00			
218	S821916	9/13/1982	40	lb	5	ft^3	Cropper disposals and fuel can# 3489	Reading @ cont 1000+ R/hr	Pu-239	4.04E+01	g		30,000
									U-235	8.28E+01	g		
									MFP	3.00E+01	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
218	S821917	9/13/1982	30	lb	5	ft^3	Cell 9 trash can # 5	300 R/hr @ contact	Pu-239	1.00E-01	g		6,000
									U-235	4.00E-01	g		
									MFP	6.00E+00	Ci		
219	S832830	3/10/1983	30	lb	5	ft^3	Cell 13 grinding waste can #3527	1000 R/hr @ contact	Pu-239	1.00E-01	g		20,000
									U-235	4.00E-01	g		
									MFP	2.00E+01	Ci		
219	S832831	3/10/1983	30	lb	5	ft^3	Cell 11 trash can 3727	Bottom entry cask	Pu-239	1.00E-01	g	30,000	800
									U-235	4.00E-01	g		
									MFP	8.00E-01	Ci		
219	S832832	3/10/1983	30	lb	5	ft^3	Cell 9 fuel & hardware can 3724	1000+R @ contact 150R @ 1 meter	Pu-239	4.05E+01	g		
									U-235	2.36E+02	g		
									MFP	1.50E+02	Ci		
219	S832833	3/10/1983	30	lb	5	ft^3	Cell 9 waste can 3725	200 R/hr contact	Pu-239	1.00E-01	g		30,000
									U-235	4.00E-01	g		
									MFP	3.00E+01	Ci		
219	S832834	3/10/1983	30	lb	5	ft^3	Cell 9 hot trash can 3524	1000+R contact 50R at 1 meter	Pu-239	1.00E-01	g		
									U-235	4.00E-01	g		
									MFP	5.00E+01	Ci		
219	S832835	3/10/1983	30	lb	5	ft^3	Cell 9 hot trash can 3495	1000+R contact 100R at 1 meter	Pu-239	4.98E+00	g		
									U-235	2.02E+01	g		
									MFP	1.00E+02	Ci		
220	S832836	3/10/1983	30	lb	5	ft^3	Cell 9 waste etc can 3728	100 R/hr @ 1m 1000+ R/hr @ con	Pu-239	1.00E-01	g		
									U-235	4.00E-01	g		
									MFP	1.00E+02	Ci		
220	S832837	3/10/1983	30	lb	5	ft^3	Cell 9 waste can 3491	100 R/hr 1m 1000+ R/hr contact	Pu-239	1.10E-01	g		
									U-235	4.00E-01	g		
									MFP	1.00E+02	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
220	S832838	3/10/1983	30	lb	5	ft^3	Cell 11 trash can 3706	100 R/hr contact	Pu-239	1.00E-01	g		2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
220	S832839	3/10/1983	30	lb	5	ft^3	Cell 13 grinding can 3528	200 R/hr contact	Pu-239	1.00E-01	g		8,000
									U-235	4.00E-01	g		
									MFP	8.00E+00	Ci		
220	S832840	3/10/1983	30	lb	5	ft^3	Cell 13 grinding can 3522	200 R/hr 1m 1000+ R/hr contact	Pu-239	1.00E-01	g		
									U-235	4.00E-01	g		
									MFP	2.00E+02	Ci		
220	S832841	3/10/1983	30	lb	5	ft^3	Cell 16 wire wrap can 3726	50 R/hr 1 m 1000+ R/hr contact	Pu-239	1.00E-01	g		50,000
									U-235	4.00E-01	g		
									MFP	5.00E+01	Ci		
221	S832842	3/10/1983	30	lb	5	ft^3	Cell 1 wire wraps 3554	400 R/hr contact	Pu-239	1.00E-01	g		15,000
									U-235	4.00E-01	g		
									MFP	1.50E+01	Ci		
221	S832843	3/10/1983	30	lb	5	ft^3	Cell 1 wire wraps 3507	1000+ R/hr contact	Pu-239	1.00E-01	g		30,000
									U-235	4.00E-01	g		
									MFP	3.00E+01	Ci		
221	S832844	3/10/1983	30	lb	5	ft^3	Cell 14 hot trash 3569	800 R/hr contact	Pu-239	1.00E-01	g		40,000
									U-235	4.00E-01	g		
									MFP	4.00E+01	Ci		
221	S832845	3/10/1983	30	lb	5	ft^3	Cell 14 hot trash can 3722	Bottom entry cask	Pu-239	1.00E-01	g	60,000	1,500
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
221	S832846	3/10/1983	30	lb	5	ft^3	Cell 14 waste can 3720	200 R/hr contact	Pu-239	1.00E-01	g		60,000
									U-235	4.00E-01	g		
									MFP	6.00E+01	Ci		
221	S832847	3/10/1983	30	lb	5	ft^3	Cell 14 waste can #3721	200 R/hr contact	Pu-239	1.00E-01	g		60,000

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									U-235	4.00E-01	g		
									MFP	3.00E+01	Ci		
222	S830716?	12/14/1983	30	lb	5.4	ft^3	Cell 14 can 3712 fuel scrap, paper, etc	900 Rhr at contact	Pu-239	5.64E-01	g		20,000
									U-235	2.25E+00	g		
									MFP	2.00E+01	Ci		
222	S830717	12/14/1983	30	lb	5.4	ft^3	Cell 14 can 3718 fuel scrap, paper, etc	200 Rhr at one meter+1000 Rhr contact	Pu-239	5.64E-01	g		
									U-235	2.25E+00	g		
									MFP	2.00E+02	Ci		
222	S830781	12/14/1983	40	lb	5.4	ft^3	Cell 14 trash 1 can	Bottom entry, ST can #1	Pu-53	5.00E-02	g	20,000	1,000
									U-36	2.00E-01	g		
									MFP	1.00E+00	Ci		
222	S830787	12/14/1983	40	lb	2.8	ft^3	Cell 9 trash 1 can	Bottom entry steel can #10 200 R/hr C.	Pu-53	1.20E-01	g		40,000
									U-36	5.00E-01	g		
									MFP	4.00E+01	Ci		
222	S830788	12/14/1983	40	lb	5.4	ft^3	Cell 14 trash 1 can	Bottom entry steel can #6 100 R/hr cont.	Pu-53	1.20E-01	g		40,000
									U-36	5.00E-01	g		
									MFP	4.00E+01	Ci		
222	S830789	12/14/1983	40	lb	2.8	ft^3	Cell 14 trash 1 can	Steel can #8	Pu-53	1.00E-01	g	10,000	200
									U-36	4.00E-01	g		
									MFP	2.00E-01	Ci		
222	S830790	12/14/1983	40	lb	2.8	ft^3	Cell 14 trash 1 can	Steel can #9 200 R contact	Pu-53	2.91E+00	g		40,000
									U-36	1.16E+01	g		
									MFP	4.00E+01	Ci		
223	S830782	12/14/1983	40	lb	5	ft^3	Cell 14 trash 1 can	Bottom entry 100 R contact can #5	Pu-53	5.00E-02	g		25,000
									U-36	2.00E-01	g		
									MFP	2.50E+01	Ci		
223	S830783	12/14/1983	40	lb	5	ft^3	Cell 14 trash 1 can	Bottom entry steel can	Pu-53	1.00E-01	g	25,000	3,000

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
								#3					
									U-36	4.00E-01	g		
									MFP	3.00E+00	Ci		
223	S830784	12/14/1983	40	lb	5	ft^3	Cell 14 trash 1 can	Bottom entry steel can #4	Pu-53	1.00E-01	g	30,000	3,000
									U-36	4.00E-01	g		
									MFP	3.00E+00	Ci		
223	S830785	12/14/1983	40	lb	5	ft^3	Cell 14 trash 1 can	Bottom entry steel can #7	Pu-53	1.00E-01	g	70,000	3,000
									U-36	4.00E-01	g		
									MFP	3.00E+00	Ci		
223	S830786	12/14/1983	40	lb	5	ft^3	Cell 14 trash 1 can	Steel can #2	Pu-53	5.00E-02	g	20,000	1,500
									U-36	2.00E-01	g		
									MFP	1.50E+00	Ci		
223	S830791	12/14/1983	40	lb	5	ft^3	Cell 16 trash 1 can	Bottom entry steel can #11	Pu-53	1.00E-01	g	32,000	1,500
									U-36	4.00E-01	g		
									MFP	1.50E+00	Ci		
224	S852326	12/30/1985	30	lb	0.5	ft^3	Cell #11 waste plastic can #4088	300 R/hr @ cont steel can #58	Pu-239	1.00E-01	g		4,000
									U-235	4.00E-01	g		
									MFP	4.00E+00	Ci		
224	S852328	12/30/1985	30	lb	0.5	ft^3	Cell #11 waste plastic can #4097	100 R/hr @ cont steel can #61	Pu-239	1.00E-01	g		2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
224	S852332	12/30/1985	30	lb	0.5	ft^3	Cell #13 waste plastic can #4072	300 R/hr @ cont steel can #32	Pu-239	1.00E-01	g		4,000
									U-235	4.00E-01	g		
									MFP	4.00E+00	Ci		
224	S852804	12/30/1985	30	lb	0.5	ft^3	Cell 14 trash can 3660 fuel inside	Steel can 67100 R contact	Pu-239	3.30E+00	g		2,800
									U-235	8.70E+00	g		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									MFP	2.80E+00	Ci		
224	S855064	12/30/1985	30	lb	0.5	ft^3	Cell 14 trash can 3661 fuel inside	Steel can 63100 R/hr contact	Pu-239	3.60E+00	g		3,300
									U-235	1.49E+01	g		
									MFP	3.80E+00	Ci		
224	S855065	12/30/1985	30	lb	0.5	ft^3	Cell 14 trash can 3662 fuel inside	Steel can 66300 R/hr contact	Pu-239	3.60E+00	g		4,200
									U-235	1.49E+01	g		
									MFP	4.20E+00	Ci		
224	S855066	12/30/1985	30	lb	0.5	ft^3	Cell 14 trash can 3663 trash only	Steel can 65	Pu-239	1.00E-01	g	70,000	1,500
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
224	S855068	12/30/1985	30	lb	0.5	ft^3	Cell 14 trash can 3664 fuel inside	Steel can 64	Pu-239	1.00E-01	g	20,000	500
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
225	S840848	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4076	Steel can #21	Pu-239	1.00E-01	g	40,000	400
		11/19/1984							U-235	4.00E-01	g		
									MFP	4.00E-01	Ci		
225	S840854	12/31/1984	30?	lb	0.5	ft^3	Cell 13 waste plastic can #4033	Steel can #24	Pu-239	1.00E-01	g	50,000	1,500
		11/16/1984							U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
225	S?????	12/31/1984?	30	lb	0.5	ft^3	Cell 13 waste plastic can #4043	Steel can #31	Pu-239	1.00E-01	g	90,000	1,500
		11/16/1984?							U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
225	S840857	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4035	105 R/hr @ cont steel can #30	Pu-239	1.00E-01			3,000
									U-235	4.00E-01			
									MFP	3.00E+00			

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
225	S840863	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4046	Steel can #40	Pu-239	1.00E-01	g	10,000	80
		11/19/1984							U-235	4.00E-01	g		
									MFP	8.00E-02	Ci		
225	S840864?	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4044	Steel can #34	Pu-239	1.00E-01	g	25,000	300
		11/19/1984							U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
225	S840807?	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4054	Steel can #38	Pu-239	1.00E-01	g	30,000	400
									U-235	4.00E-01	g		
									MFP	4.00E-01	Ci		
225	S840874	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4051	Steel can #43	Pu-239	1.00E-01	g	15,000	200
		11/20/1984							U-235	4.00E-01	g		
									MFP	2.00E-01	Ci		
226	S840842	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4056	Steel can #20	Pu-239	1.00E-01	g	90,000	2,000
		11/14/1984							U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
226	S84????3?	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4045	Steel can #26	Pu-239	1.00E-01	g	80,000	2,000
		11/14/1984							U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
226	S840844	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4023	Steel can #19	Pu-239	1.00E-01	g	70,000	1,500
		11/14/1984?							U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
226	S840845?	12/31/1984?	30	lb	0.5	ft^3	Cell 13 waste plastic can #4034	Steel can #22	Pu-239	1.00E-01	g	21,000	300
		11/14/1984?							U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
226	S840846	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4024	300 R/hr @ cont Steel can #25	Pu-239	1.00E-01	g		5,000

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
		11/15/1984							U-235	4.00E-01	g		
									MFP	5.00E+00	Ci		
226	S84??47	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4022	Steel can #23	Pu-239	1.00E-01	g	70,000	1,500
		11/15/1984							U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
226	S840862	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4027	Steel can #39	Pu-239	1.00E-01	g	15,000	200
		11/14/1984							U-235	4.00E-01	g		
									MFP	2.00E-01	Ci		
226	S840868	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can #4025	Steel can #35	Pu-239	1.00E-01	g	35,000	300
		11/15/1984							U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
227	S840877?	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4050, fuel inside	Steel can 42	Pu-239	2.20E+00	g	80,000	1,500
									U-235	8.90E+00	g		
									MFP	1.50E+00	Ci		
227	S840878?	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can, fuel inside, can 4042	250 R/hr @contact, Steel can 46	Pu-239	3.10E+00	g		2,500
									U-235	1.44E+01	g		
									MFP	2.50E+00	Ci		
227	S840879	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4041, fuel inside	300 R/hr contact, Steel can 44	Pu-239	3.10E+00	g		4,000
		11/28/1984							U-235	1.44E+01	g		
									MFP	4.00E+00	Ci		
227	S840880	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4048, fuel inside	Steel can 45, contact reading 350 R	Pu-239	3.10E+00	g		2,500
		11/29/1984							U-235	1.44E+01	g		
									MFP	2.50E+00	Ci		
227	S840881?	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4057, fuel inside	Contact 200 R/hr, Steel can 51	Pu-239	3.10E+00	g		3,000
		11/28/1984							U-235	1.44E+01	g		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
									MFP	3.00E+00	Ci		
227	S840883?	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4064	Contact 100 R/hr, Steel can 48	Pu-239	1.00E-01	g		2,000
		11/29/1984							U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
227	S840885	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4156, fuel inside	Contact 400 R/hr, Steel can 49	Pu-239	3.20E+00	g		6,000
		11/28/1984							U-235	1.06E+01	g		
									MFP	6.00E+00	Ci		
227	S840886	12/31/1984	30	lb	0.5	ft^3	Cell 14 trash can 4084	Steel can 50	Pu-239	1.00E-01	g	15,000	800
		11/29/1984							U-235	4.00E-01	g		
									MFP	8.00E-01	Ci		
228	S874123	12/23/1987	30	lbs	1	gal	Cell 14 trash can 4032	Steel can 54, was RSWD 852802	Pu-239	1.00E-01	g	9,000	150
									U-235	4.00E-01	g		
									MFP	1.50E-01	Ci		
228	S874124	12/23/1987	25	lbs	1	gal	Cell 13 waste plastic can #4093 steel	can 55, 20 R/hr contact, was RSWD #852325	Pu-239	1.00E-01	g		
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
228	S874125	12/23/1987	30	lbs	1	gal	Cell 14 waste can 4164, Steel can 62	10 R/hr contact, was RSWD #852811	Pu-239	1.00E-01	g		120
									U-235	4.00E-01	g		
									MFP	1.50E-01	Ci		
228	S874126	12/23/1987	30	lbs	1	gal	Cell #13 waste plastic can #4086, see RSWD #	852323, Steel Can #57, 200 R/hr @ cont.	Pu-239	1.00E-01	g		2,500
									U-235	4.00E-01	g		
									MFP	2.50E+00	Ci		
228	S874127	12/23/1987	30	lbs	1	gal	Cell #13 waste plastic can #4094, Was RSWD#	852324, Steel Can 56	Pu-239	1.00E-01	g		
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
228	S874128	12/23/1987	30	lbs	1	gal	Cell #11 waste plastic can #4092	Steel can #60 See RSWD #852330	Pu-239	1.00E-01	g		
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
228	S874129	12/23/1987	30	lbs	1	gal	Cell #11 waste plastic can #4085	Steel can #59, see RSWD #852329	Pu-239	1.00E-01	g	60,000	1,500
									U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
228	S874130	12/23/1987	30	lbs	1	gal	Cell #14 trash can #4053	Steel can #53, see RSWD #852803	Pu-239	1.00E-01	g	80,000	2,000
									U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
229	S840851	12/31/1984	30	lb	0.6	ft^3	Cell 13 waste plastic can #4028	200 R/hr @ cont, Steel can #28	Pu-239	1.00E-01	g		3,000
									U-235	4.00E-01	g		
									MFP	3.00E+00	Ci		
229	S840855	12/31/1984	30	lb	0.6	ft^3	Cell 13 waste plastic can 4145	Steel can #27	Pu-239	1.00E-01	g	40,000	1,000
		11/29/1984							U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
229	S84????	12/31/1984	30	lb	0.6	ft^3	Cell 13 waste plastic can #4026	150 R/hr @ cont, Steel can #36	Pu-239	1.00E-01	g		2,000
		11/29/1984							U-235	4.00E-01	g		
									MFP	2.00E+00	Ci		
229	S840865	12/31/1984	30	lb	0.6	ft^3	Cell #13 waste plastic can #4055	Steel can #37	Pu-239	1.00E-01	g	10,000	100
		11/20/1984							U-235	4.00E-01	g		
									MFP	1.00E-01	Ci		
229	S840873	12/31/1984	30	lb	0.6	ft^3	Cell 14 trash can 4065	100 Rhr contact, Steel can 41	Pu-239	3.00E+00	g		2,000
		11/19/1984							U-235	1.20E+01	g		
									MFP	2.00E+00	Ci		
229	S840882	12/31/1984	30	lb	0.6	ft^3	Cell 14 trash can 4066	Steel can 47 - 4.1 ft3 shaft	Pu-239	1.00E-01	g	18,000	300

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
		11/27/1984							U-235	4.00E-01	g		
									MFP	3.00E-01	Ci		
229	S840888	12/31/1984	30	lb	0.6	ft^3	Cell 14 trash can 4075	Steel can 52	Pu-239	1.00E-01	g	10,000	1,500
		11/26/1984							U-235	4.00E-01	g		
									MFP	1.50E-01	Ci		
230	S840831	~~10/2/1984?~~	30	lb	0.5	ft^3	Cell 9 hot waste can #4017, Steel can 13	+1000 Rhr contact, 35 Rhr at meter	Pu-239	9.60E+01	g		
		12/8/84?							U-235	2.45E+02	g		
									MFP	3.50E+01	Ci		
230	S840835	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can 4153	100 R/hr @ cont, Steel can 16	Pu-239	1.00E-01	g		1,000
		11/8/1984							U-235	4.00E-01	g		
									MFP	1.00E+01	Ci		
230	S840836	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can 3974	Steel can 15	Pu-239	1.00E-01	g	30,000	400
		10/5/1984							U-235	4.00E-01	g		
									MFP	4.00E-01	Ci		
230	S840838	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can 4154	400 R/hr @ cont, Steel can 14	Pu-239	1.00E-01	g		5,000
		11/8/1984							U-235	4.00E-01	g		
									MFP	5.00E+00	Ci		
230	S840839	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste [p]lastic can 4155	Steel can 18	Pu-239	1.00E-01	g	90,000	1,500
		11/9/1984							U-235	4.00E-01	g		
									MFP	1.50E+00	Ci		
230	S840840	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can 4037	Steel can 29	Pu-239	1.00E-01	g	90,000	1,000
									U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
230	S840841?	12/31/1984	30	lb	0.5	ft^3	Cell 13 waste plastic can 4036	Steel can 17	Pu-239	1.00E-01	g	60,000	700
		11/9/1984							U-235	4.00E-01	g		
									MFP	7.00E-01	Ci		

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
230	S840859	12/31/1984	30	lbs	0.5	ft^3	Cell 13 Waste Plastic Can #4031	Steel can #33	Pu-239	1.00E-01	g	40,000	1,000
		11/18/1984							U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
	S855059	11/4/1985			116	ft^3	HOH? Compactible hot cell waste		Pu-239			50	3
									MFP				
231	S855046	12/30/1985	30	lb	0.5	ft^3	Plastic can 3813, vacuum cleaner motor	Steel can 72, 1000+ R/hr at contact	Pu-239	1.00E-01	g		30,000
									U-235	4.00E-01	g		
									MFP	3.00E+00	Ci		
231	S855047	12/30/1985	25	lb	0.5	ft^3	Plastic can 4114, manipulator boot	Steel can 73, 1000+ R/hr at contact	Pu-239	1.00E-01	g		6,500
									U-235	3.00E-01	g		
									MFP	3.00E+00	Ci		
231	S855048	12/30/1985	30	lb	0.5	ft^3	Cell 10 trash, plastic can 3859	Steel can 74, 100 R/hr at contact	U-235	1.50E+01	g		900
									MFP	9.00E-01	Ci		
231	S855049	12/30/1985	30	lb	0.5	ft^3	Plastic can 3651, R B Robinson fuel	Steel can 75, 3 R/hr at contact	U-235	9.00E+00	g		40
									MFP	4.00E-01	Ci		
231	S856015	12/30/1985	30	lb	0.5	ft^3	Plastic can 3649	Steel can 68, 1000+ at contact	Pu-239	1.00E-01	g		22,000
									U-235	4.00E-01	g		
									MFP	2.10E+00	Ci		
231	S856016	12/30/1985	30	lb	0.5	ft^3	Cells 2/4 waste plastic can 4113	Steel can 69, 20 R/hr at contact	Pu-239	1.00E-01	g	20,000	600
									U-235	3.00E-01	g		
									MFP	6.00E+00	Ci		
231	S856017	12/30/1985	30	lb	0.5	ft^3	Plastic can 3626, Cell 9 trash	Steel can 71, 500 Rhr at contact	Pu-239	1.00E-01	g		6,000
									U-235	3.00E-01	g		
									MFP	6.00E+00	Ci		
231	S856018	12/30/1985	30	lb	0.5	ft^3	Plastic # 3625, Cell 9	Steel can No 70, 350	Pu-239	1.00E-01	g		7,000

80% DRAFT

Appendix A-3 – Information from Radioactive Solid Waste Disposal for Lined Shafts

Shaft	RSWD Number	Date Disposed	Gross Weight	Units	Gross Volume	Unit	Waste Description	Additional Description of Packaging	Radio-nuclide	Amount	Units	Surface Dose mR/hr	Dose Rate at 1 meter mR/hr
							trash	Rhr at contact					
									U-235	4.00E-01	g		
									MFP	1.00E+00	Ci		
232	S874132	12/23/1987	35	lbs	1	gal	3Mile Island waste can 77 - was on a	CWSR LA86110050600	Pu-239			6,500	
									U-25	7.00E+00	g		
									MFP				
232	S874133	12/23/1987	35	lbs	1	gal	Cell 9 waste fuel can 79 - was on a	CWSR LA86110050601, >1000 R/hr	Pu-53	1.60E+01	g		
									Pu-55	2.70E+01	g		
									Pu-56	1.20E+01	g		
									Pu-57	1.30E+01	g		
									U-235	1.35E+02	g		
									U-238	6.02E+01	g		
232	S874134	12/23/1987	35	lbs	1	gal	INC-11 Waste steel can 78 - was on a	CWSR LA86110050648	Pu-57	1.00E+00	g	29,000	
									U-21	4.80E+01	g		
									MFP				

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
200	S811387	1981			2009	Ac-227	3.56E-09	140,000
			Ba-137m	5.99E-01		Ba-137m	3.13E-01	
						Bi-211	3.51E-09	
			Cs-137	6.38E-01		Cs-137	3.34E-01	
			Eu-155	1.19E-02		Eu-155	2.39E-04	
						Fr-223	4.86E-11	
						Pa-231	1.05E-08	
						Pb-211	3.52E-09	
			Pm-147	3.65E-02		Pm-147	2.23E-05	
						Po-211	1.07E-11	
						Po-215	3.52E-09	
			Pu-239	1.25E+00		Pu-239	1.25E+00	
						Ra-223	3.56E-09	
			Rh-106	6.24E-03		Rh-106	2.01E-11	
						Rn-219	3.51E-09	
			Ru-106	4.68E-03		Ru-106	2.03E-11	
			Sb-125	2.60E-02		Sb-125	2.35E-05	
						Sm-147	8.94E-13	
			Sr-90	5.84E-01		Sr-90	3.00E-01	
			Te-125m	1.08E-02		Te-125m	5.70E-06	
						Th-227	3.46E-09	
						Th-231	1.76E-05	
						Tl-207	3.50E-09	
			U-235	1.78E-05		U-235	1.78E-05	
			Y-90	5.83E-01		Y-90	2.96E-01	
200	S811390	1981			2009	Ac-227	1.67E-08	800,000
			Ba-137m	1.44E+00		Ba-137m	7.50E-01	
						Bi-211	1.65E-08	
			Cs-137	1.53E+00		Cs-137	8.02E-01	
			Eu-155	2.87E-02		Eu-155	5.72E-04	
						Fr-223	2.28E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	4.95E-08	
						Pb-211	1.66E-08	
			Pm-147	8.75E-02		Pm-147	5.36E-05	
						Po-211	5.05E-11	
						Po-215	1.66E-08	
			Pu-239	6.21E-01		Pu-239	6.20E-01	
						Ra-223	1.67E-08	
			Rh-106	1.50E-02		Rh-106	4.83E-11	
						Rn-219	1.65E-08	
			Ru-106	1.12E-02		Ru-106	4.88E-11	
			Sb-125	6.24E-02		Sb-125	5.65E-05	
						Sm-147	2.14E-12	
			Sr-90	1.40E+00		Sr-90	7.19E-01	
			Te-125m	2.59E-02		Te-125m	1.37E-05	
						Th-227	1.63E-08	
						Th-231	8.27E-05	
						Tl-207	1.65E-08	
			U-235	8.37E-05		U-235	8.37E-05	
			Y-90	1.40E+00		Y-90	7.11E-01	
200	S811396	1981			2009	Ac-227	1.76E-10	60,000
			Ba-137m	1.44E-01		Ba-137m	7.50E-02	
						Bi-211	1.74E-10	
			Cs-137	1.53E-01		Cs-137	8.02E-02	
			Eu-155	2.87E-03		Eu-155	5.72E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	8.75E-03		Pm-147	5.36E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Rh-106	1.50E-03		Rh-106	4.83E-12	
						Rn-219	1.74E-10	
			Ru-106	1.12E-03		Ru-106	4.88E-12	
			Sb-125	6.24E-03		Sb-125	5.65E-06	
						Sm-147	2.14E-13	
			Sr-90	1.40E-01		Sr-90	7.19E-02	
			Te-125m	2.59E-03		Te-125m	1.37E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.40E-01		Y-90	7.11E-02	
200	S811398	1981			2009	Ac-227	7.04E-09	120,000
			Ba-137m	1.44E-01		Ba-137m	7.50E-02	
						Bi-211	6.95E-09	
			Cs-137	1.53E-01		Cs-137	8.02E-02	
			Eu-155	2.87E-03		Eu-155	5.72E-05	
						Fr-223	9.61E-11	
						Pa-231	2.08E-08	
						Pb-211	6.96E-09	
			Pm-147	8.75E-03		Pm-147	5.36E-06	
						Po-211	2.12E-11	
						Po-215	6.96E-09	
			Pu-239	2.48E-01		Pu-239	2.48E-01	
						Ra-223	7.04E-09	
			Rh-106	1.50E-03		Rh-106	4.83E-12	
						Rn-219	6.95E-09	
			Ru-106	1.12E-03		Ru-106	4.88E-12	
			Sb-125	6.24E-03		Sb-125	5.65E-06	
						Sm-147	2.14E-13	
			Sr-90	1.40E-01		Sr-90	7.19E-02	
			Te-125m	2.59E-03		Te-125m	1.37E-06	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-227	6.86E-09	
						Th-231	3.48E-05	
						Tl-207	6.92E-09	
			U-235	3.52E-05		U-235	3.52E-05	
			Y-90	1.40E-01		Y-90	7.11E-02	
200	S811471	1981			2009	Ac-227	9.46E-09	700,000
			Ba-137m	6.47E-01		Ba-137m	3.38E-01	
						Bi-211	9.34E-09	
			Cs-137	6.89E-01		Cs-137	3.61E-01	
			Eu-155	1.29E-02		Eu-155	2.58E-04	
						Fr-223	1.29E-10	
						Pa-231	2.80E-08	
						Pb-211	9.36E-09	
			Pm-147	3.94E-02		Pm-147	2.41E-05	
						Po-211	2.85E-11	
						Po-215	9.36E-09	
			Pu-239	7.75E-01		Pu-239	7.74E-01	
						Ra-223	9.46E-09	
			Rh-106	6.74E-03		Rh-106	2.17E-11	
						Rn-219	9.35E-09	
			Ru-106	5.06E-03		Ru-106	2.20E-11	
			Sb-125	2.81E-02		Sb-125	2.54E-05	
						Sm-147	9.65E-13	
			Sr-90	6.30E-01		Sr-90	3.24E-01	
			Te-125m	1.17E-02		Te-125m	6.15E-06	
						Th-227	9.21E-09	
						Th-231	4.67E-05	
						Tl-207	9.30E-09	
			U-235	4.73E-05		U-235	4.73E-05	
			Y-90	6.29E-01		Y-90	3.20E-01	
200	S811473	1981			2009	Ac-227	2.16E-08	1,150,000
			Ba-137m	4.79E+00		Ba-137m	2.50E+00	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-211	2.13E-08	
			Cs-137	5.11E+00		Cs-137	2.67E+00	
			Eu-155	9.55E-02		Eu-155	1.91E-03	
						Fr-223	2.94E-10	
						Pa-231	6.38E-08	
						Pb-211	2.13E-08	
			Pm-147	2.92E-01		Pm-147	1.79E-04	
						Po-211	6.50E-11	
						Po-215	2.13E-08	
			Pu-239	3.10E-01		Pu-239	3.10E-01	
						Ra-223	2.16E-08	
			Rh-106	5.00E-02		Rh-106	1.61E-10	
						Rn-219	2.13E-08	
			Ru-106	3.74E-02		Ru-106	1.63E-10	
			Sb-125	2.08E-01		Sb-125	1.88E-04	
						Sm-147	7.15E-12	
			Sr-90	4.67E+00		Sr-90	2.40E+00	
			Te-125m	8.63E-02		Te-125m	4.56E-05	
						Th-227	2.10E-08	
						Th-231	1.07E-04	
						Tl-207	2.12E-08	
			U-235	1.08E-04		U-235	1.08E-04	
			Y-90	4.66E+00		Y-90	2.37E+00	
201	S791484	1979			2009	Ac-227	4.97E-10	17,500
			Ba-137m	9.59E-01		Ba-137m	4.78E-01	
						Bi-211	4.90E-10	
			Cs-137	1.02E+00		Cs-137	5.11E-01	
			Eu-155	1.91E-02		Eu-155	2.89E-04	
						Fr-223	6.78E-12	
						Pa-231	1.40E-09	
						Pb-211	4.91E-10	
			Pm-147	5.83E-02		Pm-147	2.11E-05	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	1.50E-12	
						Po-215	4.91E-10	
			Pu-239	1.86E-01		Pu-239	1.86E-01	
						Ra-223	4.96E-10	
			Rh-106	9.99E-03		Rh-106	8.15E-12	
						Rn-219	4.90E-10	
			Ru-106	7.49E-03		Ru-106	8.23E-12	
			Sb-125	4.16E-02		Sb-125	2.28E-05	
						Sm-147	1.43E-12	
			Sr-90	9.34E-01		Sr-90	4.57E-01	
			Te-125m	1.73E-02		Te-125m	5.53E-06	
						Th-227	4.84E-10	
						Th-231	2.18E-06	
						Tl-207	4.88E-10	
			U-235	2.20E-06		U-235	2.21E-06	
			Y-90	9.33E-01		Y-90	4.52E-01	
201	S794215	1979			2009	Ac-227	9.93E-10	266,000
			Ba-137m	2.64E+00		Ba-137m	1.31E+00	
						Bi-211	9.80E-10	
			Cs-137	2.81E+00		Cs-137	1.40E+00	
			Eu-155	5.26E-02		Eu-155	7.93E-04	
						Fr-223	1.35E-11	
						Pa-231	2.79E-09	
						Pb-211	9.81E-10	
			Pm-147	1.60E-01		Pm-147	5.79E-05	
						Po-211	2.99E-12	
						Po-215	9.81E-10	
			Pu-239	3.41E-02		Pu-239	3.41E-02	
						Ra-223	9.92E-10	
			Rh-106	2.75E-02		Rh-106	2.24E-11	
						Rn-219	9.80E-10	
			Ru-106	2.06E-02		Ru-106	2.26E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sb-125	1.14E-01		Sb-125	6.28E-05	
						Sm-147	3.93E-12	
			Sr-90	2.57E+00		Sr-90	1.26E+00	
			Te-125m	4.75E-02		Te-125m	1.52E-05	
						Th-227	9.66E-10	
						Th-231	4.35E-06	
						Tl-207	9.76E-10	
			U-235	4.40E-06		U-235	4.40E-06	
			Y-90	2.56E+00		Y-90	1.24E+00	
201	S794216	1979			2009	Ac-227	4.47E-09	261,000
			Ba-137m	1.92E+00		Ba-137m	9.55E-01	
						Bi-211	4.41E-09	
			Cs-137	2.04E+00		Cs-137	1.02E+00	
			Eu-155	3.82E-02		Eu-155	5.77E-04	
						Fr-223	6.09E-11	
						Pa-231	1.25E-08	
						Pb-211	4.42E-09	
			Pm-147	1.17E-01		Pm-147	4.21E-05	
						Po-211	1.35E-11	
						Po-215	4.42E-09	
			Pu-239	1.40E-01		Pu-239	1.39E-01	
						Ra-223	4.46E-09	
			Rh-106	2.00E-02		Rh-106	1.63E-11	
						Rn-219	4.41E-09	
			Ru-106	1.50E-02		Ru-106	1.65E-11	
			Sb-125	8.32E-02		Sb-125	4.57E-05	
						Sm-147	2.86E-12	
			Sr-90	1.87E+00		Sr-90	9.14E-01	
			Te-125m	3.45E-02		Te-125m	1.11E-05	
						Th-227	4.35E-09	
						Th-231	1.96E-05	
						Tl-207	4.39E-09	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-235	1.98E-05		U-235	1.98E-05	
			Y-90	1.87E+00		Y-90	9.04E-01	
201	S794218	1979			2009	Ac-227	4.96E-09	15,000
			Ba-137m	2.40E-01		Ba-137m	1.19E-01	
						Bi-211	4.90E-09	
			Cs-137	2.55E-01		Cs-137	1.28E-01	
			Eu-155	4.78E-03		Eu-155	7.21E-05	
						Fr-223	6.77E-11	
						Pa-231	1.39E-08	
						Pb-211	4.91E-09	
			Pm-147	1.46E-02		Pm-147	5.27E-06	
						Po-211	1.50E-11	
						Po-215	4.91E-09	
			Pu-239	1.55E-01		Pu-239	1.55E-01	
						Ra-223	4.96E-09	
			Rh-106	2.50E-03		Rh-106	2.04E-12	
						Rn-219	4.90E-09	
			Ru-106	1.87E-03		Ru-106	2.06E-12	
			Sb-125	1.04E-02		Sb-125	5.71E-06	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.14E-01	
			Te-125m	4.32E-03		Te-125m	1.38E-06	
						Th-227	4.83E-09	
						Th-231	2.17E-05	
						Tl-207	4.88E-09	
			U-235	2.20E-05		U-235	2.20E-05	
			Y-90	2.33E-01		Y-90	1.13E-01	
201	S794219	1979			2009	Ac-227	2.48E-09	27,000
			Ba-137m	3.12E-01		Ba-137m	1.55E-01	
						Bi-211	2.45E-09	
			Cs-137	3.32E-01		Cs-137	1.66E-01	
			Eu-155	6.21E-03		Eu-155	9.38E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Fr-223	3.39E-11	
						Pa-231	6.97E-09	
						Pb-211	2.45E-09	
			Pm-147	1.90E-02		Pm-147	6.85E-06	
						Po-211	7.48E-12	
						Po-215	2.45E-09	
			Pu-239	9.30E-02		Pu-239	9.29E-02	
						Ra-223	2.48E-09	
			Rh-106	3.25E-03		Rh-106	2.65E-12	
						Rn-219	2.45E-09	
			Ru-106	2.43E-03		Ru-106	2.67E-12	
			Sb-125	1.35E-02		Sb-125	7.42E-06	
						Sm-147	4.65E-13	
			Sr-90	3.03E-01		Sr-90	1.49E-01	
			Te-125m	5.61E-03		Te-125m	1.80E-06	
						Th-227	2.41E-09	
						Th-231	1.09E-05	
						Tl-207	2.44E-09	
			U-235	1.10E-05		U-235	1.10E-05	
			Y-90	3.03E-01		Y-90	1.47E-01	
201	S794220	1979			2009	Ac-227	7.29E-08	1,200,000
			Ba-137m	7.19E+00		Ba-137m	3.58E+00	
						Bi-211	7.20E-08	
			Cs-137	7.66E+00		Cs-137	3.83E+00	
			Eu-155	1.43E-01		Eu-155	2.16E-03	
						Fr-223	9.95E-10	
						Pa-231	2.05E-07	
						Pb-211	7.21E-08	
			Pm-147	4.38E-01		Pm-147	1.58E-04	
						Po-211	2.20E-10	
						Po-215	7.21E-08	
			Pu-239	4.22E+00		Pu-239	4.21E+00	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	7.29E-08	
			Rh-106	7.49E-02		Rh-106	6.11E-11	
						Rn-219	7.20E-08	
			Ru-106	5.62E-02		Ru-106	6.17E-11	
			Sb-125	3.12E-01		Sb-125	1.71E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.43E+00	
			Te-125m	1.30E-01		Te-125m	4.15E-05	
						Th-227	7.10E-08	
						Th-231	3.20E-04	
						Tl-207	7.17E-08	
			U-235	3.23E-04		U-235	3.23E-04	
			Y-90	6.99E+00		Y-90	3.39E+00	
201	S794221	1979			2009	Ac-227	1.84E-07	1,050,000
			Ba-137m	8.39E+00		Ba-137m	4.18E+00	
						Bi-211	1.81E-07	
			Cs-137	8.94E+00		Cs-137	4.47E+00	
			Eu-155	1.67E-01		Eu-155	2.52E-03	
						Fr-223	2.51E-09	
						Pa-231	5.16E-07	
						Pb-211	1.82E-07	
			Pm-147	5.10E-01		Pm-147	1.84E-04	
						Po-211	5.53E-10	
						Po-215	1.82E-07	
			Pu-239	8.68E+00		Pu-239	8.67E+00	
						Ra-223	1.84E-07	
			Rh-106	8.74E-02		Rh-106	7.13E-11	
						Rn-219	1.81E-07	
			Ru-106	6.55E-02		Ru-106	7.20E-11	
			Sb-125	3.64E-01		Sb-125	2.00E-04	
						Sm-147	1.25E-11	
			Sr-90	8.17E+00		Sr-90	4.00E+00	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	1.51E-01		Te-125m	4.84E-05	
						Th-227	1.79E-07	
						Th-231	8.04E-04	
						Tl-207	1.81E-07	
			U-235	8.14E-04		U-235	8.14E-04	
			Y-90	8.16E+00		Y-90	3.95E+00	
202	S803548	1979			2009	Ac-227	1.11E-07	
			Ba-137m	5.15E+01		Ba-137m	2.57E+01	
						Bi-211	1.09E-07	
			Cs-137	5.49E+01		Cs-137	2.74E+01	
			Eu-155	1.03E+00		Eu-155	1.55E-02	
						Fr-223	1.51E-09	
						Pa-231	3.11E-07	
						Pb-211	1.09E-07	
			Pm-147	3.14E+00		Pm-147	1.13E-03	
						Po-211	3.33E-10	
						Po-215	1.09E-07	
			Pu-239	4.05E+00		Pu-239	4.05E+00	
						Ra-223	1.11E-07	
			Rh-106	5.37E-01		Rh-106	4.38E-10	
						Rn-219	1.09E-07	
			Ru-106	4.03E-01		Ru-106	4.42E-10	
			Sb-125	2.24E+00		Sb-125	1.23E-03	
						Sm-147	7.69E-11	
			Sr-90	5.02E+01		Sr-90	2.46E+01	
			Te-125m	9.28E-01		Te-125m	2.97E-04	
						Th-227	1.08E-07	
						Th-231	4.84E-04	
						Tl-207	1.09E-07	
			U-235	4.90E-04		U-235	4.91E-04	
			Y-90	5.01E+01		Y-90	2.43E+01	
203	S803547	1979			2009	Ac-227	6.30E-08	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	2.61E+01		Ba-137m	1.30E+01	
						Bi-211	6.22E-08	
			Cs-137	2.78E+01		Cs-137	1.39E+01	
			Eu-155	5.19E-01		Eu-155	7.84E-03	
						Fr-223	8.60E-10	
						Pa-231	1.77E-07	
						Pb-211	6.23E-08	
			Pm-147	1.59E+00		Pm-147	5.72E-04	
						Po-211	1.90E-10	
						Po-215	6.23E-08	
			Pu-239	2.33E+00		Pu-239	2.32E+00	
						Ra-223	6.30E-08	
			Rh-106	2.71E-01		Rh-106	2.21E-10	
						Rn-219	6.22E-08	
			Ru-106	2.04E-01		Ru-106	2.24E-10	
			Sb-125	1.13E+00		Sb-125	6.21E-04	
						Sm-147	3.89E-11	
			Sr-90	2.54E+01		Sr-90	1.24E+01	
			Te-125m	4.69E-01		Te-125m	1.50E-04	
						Th-227	6.13E-08	
						Th-231	2.76E-04	
						Tl-207	6.20E-08	
			U-235	2.79E-04		U-235	2.79E-04	
			Y-90	2.53E+01		Y-90	1.23E+01	
204	S791472	1979			2009	Ac-227	2.61E-09	108,000
			Ba-137m	2.52E+00		Ba-137m	1.25E+00	
						Bi-211	2.57E-09	
			Cs-137	2.68E+00		Cs-137	1.34E+00	
			Eu-155	5.02E-02		Eu-155	7.58E-04	
						Fr-223	3.55E-11	
						Pa-231	7.32E-09	
						Pb-211	2.58E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	1.53E-01		Pm-147	5.53E-05	
						Po-211	7.85E-12	
						Po-215	2.58E-09	
			Pu-239	1.09E-01		Pu-239	1.08E-01	
						Ra-223	2.60E-09	
			Rh-106	2.62E-02		Rh-106	2.14E-11	
						Rn-219	2.57E-09	
			Ru-106	1.97E-02		Ru-106	2.16E-11	
			Sb-125	1.09E-01		Sb-125	5.99E-05	
						Sm-147	3.75E-12	
			Sr-90	2.45E+00		Sr-90	1.20E+00	
			Te-125m	4.53E-02		Te-125m	1.45E-05	
						Th-227	2.54E-09	
						Th-231	1.14E-05	
						Tl-207	2.56E-09	
			U-235	1.16E-05		U-235	1.16E-05	
			Y-90	2.45E+00		Y-90	1.19E+00	
204	S791478	1979			2009	Ac-227	6.00E-08	1000000+
						Bi-211	5.93E-08	
						Fr-223	8.19E-10	
						Pa-231	1.69E-07	
						Pb-211	5.94E-08	
						Po-211	1.81E-10	
						Po-215	5.94E-08	
			Pu-239	2.17E+00		Pu-239	2.17E+00	
						Ra-223	6.00E-08	
						Rn-219	5.93E-08	
						Th-227	5.85E-08	
						Th-231	2.63E-04	
						Tl-207	5.90E-08	
			U-235	2.66E-04		U-235	2.66E-04	
204	S791483	1979			2009	Ac-227	2.23E-09	50,000

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	3.59E-01		Ba-137m	1.79E-01	
						Bi-211	2.20E-09	
			Cs-137	3.83E-01		Cs-137	1.91E-01	
			Eu-155	7.17E-03		Eu-155	1.08E-04	
						Fr-223	3.05E-11	
						Pa-231	6.28E-09	
						Pb-211	2.21E-09	
			Pm-147	2.19E-02		Pm-147	7.90E-06	
						Po-211	6.73E-12	
						Po-215	2.21E-09	
			Pu-239	9.30E-02		Pu-239	9.29E-02	
						Ra-223	2.23E-09	
			Rh-106	3.75E-03		Rh-106	3.05E-12	
						Rn-219	2.20E-09	
			Ru-106	2.81E-03		Ru-106	3.08E-12	
			Sb-125	1.56E-02		Sb-125	8.56E-06	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.71E-01	
			Te-125m	6.48E-03		Te-125m	2.07E-06	
						Th-227	2.17E-09	
						Th-231	9.78E-06	
						Tl-207	2.19E-09	
			U-235	9.90E-06		U-235	9.90E-06	
			Y-90	3.50E-01		Y-90	1.70E-01	
204	S794222	1979			2009	Ac-227	9.43E-09	
						Bi-211	9.31E-09	
						Fr-223	1.29E-10	
						Pa-231	2.65E-08	
						Pb-211	9.32E-09	
						Po-211	2.84E-11	
						Po-215	9.32E-09	
			Pu-239	2.95E-01		Pu-239	2.94E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	9.42E-09	
						Rn-219	9.31E-09	
						Th-227	9.18E-09	
						Th-231	4.13E-05	
						Tl-207	9.27E-09	
			U-235	4.18E-05		U-235	4.18E-05	
204	S794223	1979			2009	Ac-227	2.17E-08	
			Ba-137m	4.79E+00		Ba-137m	2.39E+00	
						Bi-211	2.15E-08	
			Cs-137	5.11E+00		Cs-137	2.55E+00	
			Eu-155	9.55E-02		Eu-155	1.44E-03	
						Fr-223	2.97E-10	
						Pa-231	6.11E-08	
						Pb-211	2.15E-08	
			Pm-147	2.92E-01		Pm-147	1.05E-04	
						Po-211	6.55E-11	
						Po-215	2.15E-08	
			Pu-239	1.02E+00		Pu-239	1.02E+00	
						Ra-223	2.17E-08	
			Rh-106	5.00E-02		Rh-106	4.07E-11	
						Rn-219	2.15E-08	
			Ru-106	3.74E-02		Ru-106	4.11E-11	
			Sb-125	2.08E-01		Sb-125	1.14E-04	
						Sm-147	7.15E-12	
			Sr-90	4.67E+00		Sr-90	2.29E+00	
			Te-125m	8.63E-02		Te-125m	2.76E-05	
						Th-227	2.12E-08	
						Th-231	9.52E-05	
						Tl-207	2.14E-08	
			U-235	9.64E-05		U-235	9.64E-05	
			Y-90	4.66E+00		Y-90	2.26E+00	
205	S801483	1980			2009	Ac-227	4.68E-11	1000000+

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	3.24E+01		Ba-137m	1.65E+01	
						Bi-211	4.62E-11	
			Cs-137	3.45E+01		Cs-137	1.76E+01	
			Eu-155	6.45E-01		Eu-155	1.12E-02	
						Fr-223	6.39E-13	
						Pa-231	1.35E-10	
						Pb-211	4.63E-11	
			Pm-147	1.97E+00		Pm-147	9.26E-04	
						Po-211	1.41E-13	
						Po-215	4.63E-11	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	4.68E-11	
			Rh-106	3.37E-01		Rh-106	5.47E-10	
						Rn-219	4.62E-11	
			Ru-106	2.53E-01		Ru-106	5.52E-10	
			Sb-125	1.40E+00		Sb-125	9.90E-04	
						Sm-147	4.83E-11	
			Sr-90	3.15E+01		Sr-90	1.58E+01	
			Te-125m	5.83E-01		Te-125m	2.40E-04	
						Th-227	4.56E-11	
						Th-231	2.17E-07	
						Tl-207	4.60E-11	
			U-235	2.20E-07		U-235	2.20E-07	
			Y-90	3.15E+01		Y-90	1.56E+01	
205	S801485	1980			2009	Ac-227	3.37E-12	1000000+
			Ba-137m	4.07E+01		Ba-137m	2.08E+01	
						Bi-211	3.32E-12	
			Cs-137	4.34E+01		Cs-137	2.22E+01	
			Eu-155	8.12E-01		Eu-155	1.41E-02	
						Fr-223	4.59E-14	
						Pa-231	1.36E-11	
						Pb-211	3.33E-12	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	2.48E+00		Pm-147	1.17E-03	
						Po-211	1.01E-14	
						Po-215	3.33E-12	
			Pu-239	1.55E+00		Pu-239	1.55E+00	
						Ra-223	3.37E-12	
			Rh-106	4.25E-01		Rh-106	6.89E-10	
						Rn-219	3.33E-12	
			Ru-106	3.18E-01		Ru-106	6.95E-10	
			Sb-125	1.77E+00		Sb-125	1.25E-03	
						Sm-147	6.08E-11	
			Sr-90	3.97E+01		Sr-90	1.99E+01	
			Te-125m	7.34E-01		Te-125m	3.02E-04	
						Th-227	3.28E-12	
						Th-231	4.38E-08	
						Tl-207	3.31E-12	
			U-235	2.09E-04		U-235	4.43E-08	
			Y-90	3.96E+01		Y-90	1.97E+01	
205	S802244	1980			2009	Ac-227	9.35E-09	160,000
			Ba-137m	9.83E-01		Ba-137m	5.01E-01	
						Bi-211	9.24E-09	
			Cs-137	1.05E+00		Cs-137	5.36E-01	
			Eu-155	1.96E-02		Eu-155	3.40E-04	
						Fr-223	1.28E-10	
						Pa-231	2.70E-08	
						Pb-211	9.25E-09	
			Pm-147	5.98E-02		Pm-147	2.81E-05	
						Po-211	2.82E-11	
						Po-215	9.25E-09	
			Pu-239	3.10E-02		Pu-239	3.10E-02	
						Ra-223	9.35E-09	
			Rh-106	1.02E-02		Rh-106	1.66E-11	
						Rn-219	9.24E-09	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	7.68E-03		Ru-106	1.68E-11	
			Sb-125	4.26E-02		Sb-125	3.01E-05	
						Sm-147	1.47E-12	
			Sr-90	9.57E-01		Sr-90	4.80E-01	
			Te-125m	1.77E-02		Te-125m	7.28E-06	
						Th-227	9.11E-09	
						Th-231	4.35E-05	
						Tl-207	9.20E-09	
			U-235	4.40E-05		U-235	4.40E-05	
			Y-90	9.56E-01		Y-90	4.74E-01	
205	S802246	1980			2009	Ac-227	3.27E-08	1,000,000
			Ba-137m	3.36E-01		Ba-137m	1.71E-01	
						Bi-211	3.23E-08	
			Cs-137	3.57E-01		Cs-137	1.83E-01	
			Eu-155	6.69E-03		Eu-155	1.16E-04	
						Fr-223	4.47E-10	
						Pa-231	9.44E-08	
						Pb-211	3.24E-08	
			Pm-147	2.04E-02		Pm-147	9.61E-06	
						Po-211	9.87E-11	
						Po-215	3.24E-08	
			Pu-239	1.09E+00		Pu-239	1.08E+00	
						Ra-223	3.27E-08	
			Rh-106	3.50E-03		Rh-106	5.67E-12	
						Rn-219	3.23E-08	
			Ru-106	2.62E-03		Ru-106	5.73E-12	
			Sb-125	1.46E-02		Sb-125	1.03E-05	
						Sm-147	5.00E-13	
			Sr-90	3.27E-01		Sr-90	1.64E-01	
			Te-125m	6.04E-03		Te-125m	2.48E-06	
						Th-227	3.19E-08	
						Th-231	1.52E-04	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Tl-207	3.22E-08	
			U-235	1.54E-04		U-235	1.54E-04	
			Y-90	3.26E-01		Y-90	1.62E-01	
205	S802247	1980			2009	Ac-227	9.82E-09	615,000
			Ba-137m	2.88E-01		Ba-137m	1.47E-01	
						Bi-211	9.70E-09	
			Cs-137	3.06E-01		Cs-137	1.57E-01	
			Eu-155	5.73E-03		Eu-155	9.95E-05	
						Fr-223	1.34E-10	
						Pa-231	2.83E-08	
						Pb-211	9.71E-09	
			Pm-147	1.75E-02		Pm-147	8.23E-06	
						Po-211	2.96E-11	
						Po-215	9.71E-09	
			Pu-239	3.10E-01		Pu-239	3.10E-01	
						Ra-223	9.82E-09	
			Rh-106	3.00E-03		Rh-106	4.86E-12	
						Rn-219	9.70E-09	
			Ru-106	2.25E-03		Ru-106	4.91E-12	
			Sb-125	1.25E-02		Sb-125	8.80E-06	
						Sm-147	4.29E-13	
			Sr-90	2.80E-01		Sr-90	1.40E-01	
			Te-125m	5.18E-03		Te-125m	2.13E-06	
						Th-227	9.56E-09	
						Th-231	4.56E-05	
						Tl-207	9.66E-09	
			U-235	4.62E-05		U-235	4.62E-05	
			Y-90	2.80E-01		Y-90	1.39E-01	
205	S802259	1980			2009	Ac-227	1.82E-08	1000000+
			Ba-137m	8.39E+00		Ba-137m	4.28E+00	
						Bi-211	1.80E-08	
			Cs-137	8.94E+00		Cs-137	4.57E+00	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Eu-155	1.67E-01		Eu-155	2.90E-03	
						Fr-223	2.49E-10	
						Pa-231	5.26E-08	
						Pb-211	1.80E-08	
			Pm-147	5.10E-01		Pm-147	2.40E-04	
						Po-211	5.50E-11	
						Po-215	1.80E-08	
			Pu-239	7.44E-01		Pu-239	7.43E-01	
						Ra-223	1.82E-08	
			Rh-106	8.74E-02		Rh-106	1.42E-10	
						Rn-219	1.80E-08	
			Ru-106	6.55E-02		Ru-106	1.43E-10	
			Sb-125	3.64E-01		Sb-125	2.57E-04	
						Sm-147	1.25E-11	
			Sr-90	8.17E+00		Sr-90	4.10E+00	
			Te-125m	1.51E-01		Te-125m	6.21E-05	
						Th-227	1.78E-08	
						Th-231	8.47E-05	
						Tl-207	1.79E-08	
			U-235	8.58E-05		U-235	8.58E-05	
			Y-90	8.16E+00		Y-90	4.05E+00	
205	S802287	1980			2009	Ac-227	1.10E-07	1000000+
			Ba-137m	1.25E+02		Ba-137m	6.35E+01	
						Bi-211	1.09E-07	
			Cs-137	1.33E+02		Cs-137	6.79E+01	
			Eu-155	2.48E+00		Eu-155	4.31E-02	
						Fr-223	1.51E-09	
						Pa-231	3.18E-07	
						Pb-211	1.09E-07	
			Pm-147	7.58E+00		Pm-147	3.57E-03	
						Po-211	3.33E-10	
						Po-215	1.09E-07	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pu-239	3.53E+00		Pu-239	3.53E+00	
						Ra-223	1.10E-07	
			Rh-106	1.30E+00		Rh-106	2.11E-09	
						Rn-219	1.09E-07	
			Ru-106	9.74E-01		Ru-106	2.13E-09	
			Sb-125	5.41E+00		Sb-125	3.81E-03	
						Sm-147	1.86E-10	
			Sr-90	1.21E+02		Sr-90	6.09E+01	
			Te-125m	2.25E+00		Te-125m	9.23E-04	
						Th-227	1.07E-07	
						Th-231	5.13E-04	
						Tl-207	1.09E-07	
			U-235	5.19E-04		U-235	5.19E-04	
			Y-90	1.21E+02		Y-90	6.02E+01	
206	S812291	1981			2009	Ac-227	1.41E-07	1000000+
			Ba-137m	9.59E+00		Ba-137m	5.00E+00	
						Bi-211	1.39E-07	
			Cs-137	1.02E+01		Cs-137	5.35E+00	
			Eu-155	1.91E-01		Eu-155	3.82E-03	
						Fr-223	1.93E-09	
						Pa-231	4.18E-07	
						Pb-211	1.40E-07	
			Pm-147	5.83E-01		Pm-147	3.57E-04	
						Po-211	4.26E-10	
						Po-215	1.40E-07	
			Pu-239	7.63E+00		Pu-239	7.62E+00	
						Ra-223	1.41E-07	
			Rh-106	9.99E-02		Rh-106	3.22E-10	
						Rn-219	1.39E-07	
			Ru-106	7.49E-02		Ru-106	3.25E-10	
			Sb-125	4.16E-01		Sb-125	3.77E-04	
						Sm-147	1.43E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sr-90	9.34E+00		Sr-90	4.80E+00	
			Te-125m	1.73E-01		Te-125m	9.12E-05	
						Th-227	1.38E-07	
						Th-231	6.98E-04	
						Tl-207	1.39E-07	
			U-235	7.06E-04		U-235	7.06E-04	
			Y-90	9.33E+00		Y-90	4.74E+00	
206	S812292	1981			2009	Ac-227	1.18E-07	1000000+
			Ba-137m	5.27E+00		Ba-137m	2.75E+00	
						Bi-211	1.17E-07	
			Cs-137	5.62E+00		Cs-137	2.94E+00	
			Eu-155	1.05E-01		Eu-155	2.10E-03	
						Fr-223	1.62E-09	
						Pa-231	3.50E-07	
						Pb-211	1.17E-07	
			Pm-147	3.21E-01		Pm-147	1.97E-04	
						Po-211	3.57E-10	
						Po-215	1.17E-07	
			Pu-239	6.20E+00		Pu-239	6.20E+00	
						Ra-223	1.18E-07	
			Rh-106	5.49E-02		Rh-106	1.77E-10	
						Rn-219	1.17E-07	
			Ru-106	4.12E-02		Ru-106	1.79E-10	
			Sb-125	2.29E-01		Sb-125	2.07E-04	
						Sm-147	7.86E-12	
			Sr-90	5.14E+00		Sr-90	2.64E+00	
			Te-125m	9.50E-02		Te-125m	5.01E-05	
						Th-227	1.15E-07	
						Th-231	5.85E-04	
						Tl-207	1.16E-07	
			U-235	5.92E-04		U-235	5.92E-04	
			Y-90	5.13E+00		Y-90	2.61E+00	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
206	S812293	1981			2009	Ac-227	1.23E-08	1,000,000
			Ba-137m	2.40E+01		Ba-137m	1.25E+01	
						Bi-211	1.22E-08	
			Cs-137	2.55E+01		Cs-137	1.34E+01	
			Eu-155	4.78E-01		Eu-155	9.54E-03	
						Fr-223	1.68E-10	
						Pa-231	3.64E-08	
						Pb-211	1.22E-08	
			Pm-147	1.46E+00		Pm-147	8.93E-04	
						Po-211	3.71E-11	
						Po-215	1.22E-08	
			Pu-239	4.34E-01		Pu-239	4.34E-01	
						Ra-223	1.23E-08	
			Rh-106	2.50E-01		Rh-106	8.06E-10	
						Rn-219	1.22E-08	
			Ru-106	1.87E-01		Ru-106	8.14E-10	
			Sb-125	1.04E+00		Sb-125	9.42E-04	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.20E+01	
			Te-125m	4.32E-01		Te-125m	2.28E-04	
						Th-227	1.20E-08	
						Th-231	6.09E-05	
						Tl-207	1.21E-08	
			U-235	6.16E-05		U-235	6.16E-05	
			Y-90	2.33E+01		Y-90	1.19E+01	
206	S812297	1981			2009	Ac-227	3.68E-08	1000000+
			Ba-137m	2.40E+01		Ba-137m	1.25E+01	
						Bi-211	3.63E-08	
			Cs-137	2.55E+01		Cs-137	1.34E+01	
			Eu-155	4.78E-01		Eu-155	9.54E-03	
						Fr-223	5.02E-10	
						Pa-231	1.09E-07	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pb-211	3.64E-08	
			Pm-147	1.46E+00		Pm-147	8.93E-04	
						Po-211	1.11E-10	
						Po-215	3.64E-08	
			Pu-239	1.36E+00		Pu-239	1.36E+00	
						Ra-223	3.68E-08	
			Rh-106	2.50E-01		Rh-106	8.06E-10	
						Rn-219	3.63E-08	
			Ru-106	1.87E-01		Ru-106	8.14E-10	
			Sb-125	1.04E+00		Sb-125	9.42E-04	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.20E+01	
			Te-125m	4.32E-01		Te-125m	2.28E-04	
						Th-227	3.58E-08	
						Th-231	1.82E-04	
						Tl-207	3.62E-08	
			U-235	1.84E-04		U-235	1.84E-04	
			Y-90	2.33E+01		Y-90	1.19E+01	
206	S812298	1981			2009	Ac-227	3.79E-08	1000000+
			Ba-137m	2.40E+01		Ba-137m	1.25E+01	
						Bi-211	3.74E-08	
			Cs-137	2.55E+01		Cs-137	1.34E+01	
			Eu-155	4.78E-01		Eu-155	9.54E-03	
						Fr-223	5.17E-10	
						Pa-231	1.12E-07	
						Pb-211	3.74E-08	
			Pm-147	1.46E+00		Pm-147	8.93E-04	
						Po-211	1.14E-10	
						Po-215	3.74E-08	
			Pu-239	1.36E+00		Pu-239	1.36E+00	
						Ra-223	3.78E-08	
			Rh-106	2.50E-01		Rh-106	8.06E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Rn-219	3.74E-08	
			Ru-106	1.87E-01		Ru-106	8.14E-10	
			Sb-125	1.04E+00		Sb-125	9.42E-04	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.20E+01	
			Te-125m	4.32E-01		Te-125m	2.28E-04	
						Th-227	3.68E-08	
						Th-231	1.87E-04	
						Tl-207	3.72E-08	
			U-235	1.89E-04		U-235	1.89E-04	
			Y-90	2.33E+01		Y-90	1.19E+01	
206	S812302	1981			2009	Ac-227	1.01E-08	1010000+
			Ba-137m	1.97E+00		Ba-137m	1.03E+00	
						Bi-211	9.99E-09	
			Cs-137	2.09E+00		Cs-137	1.10E+00	
			Eu-155	3.92E-02		Eu-155	7.82E-04	
						Fr-223	1.38E-10	
						Pa-231	2.99E-08	
						Pb-211	1.00E-08	
			Pm-147	1.20E-01		Pm-147	7.33E-05	
						Po-211	3.05E-11	
						Po-215	1.00E-08	
			Pu-239	4.96E-01		Pu-239	4.96E-01	
						Ra-223	1.01E-08	
			Rh-106	2.05E-02		Rh-106	6.60E-11	
						Rn-219	1.00E-08	
			Ru-106	1.54E-02		Ru-106	6.67E-11	
			Sb-125	8.53E-02		Sb-125	7.72E-05	
						Sm-147	2.93E-12	
			Sr-90	1.91E+00		Sr-90	9.83E-01	
			Te-125m	3.54E-02		Te-125m	1.87E-05	
						Th-227	9.85E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-231	5.00E-05	
						Tl-207	9.95E-09	
			U-235	5.06E-05		U-235	5.06E-05	
			Y-90	1.91E+00		Y-90	9.72E-01	
206	S812303	1981			2009	Ac-227	1.01E-08	
						Bi-211	9.96E-09	
						Fr-223	1.38E-10	
						Pa-231	2.98E-08	
						Pb-211	9.97E-09	
						Po-211	3.04E-11	
						Po-215	9.97E-09	
			Pu-239	5.03E-01		Pu-239	5.03E-01	
						Ra-223	1.01E-08	
						Rn-219	9.96E-09	
						Th-227	9.81E-09	
						Th-231	4.98E-05	
						Tl-207	9.91E-09	
			U-235	5.04E-05		U-235	5.04E-05	
207	S811397	1981			2009	Ac-227	1.76E-10	60,000
			Ba-137m	4.79E-01		Ba-137m	2.50E-01	
						Bi-211	1.74E-10	
			Cs-137	5.11E-01		Cs-137	2.67E-01	
			Eu-155	9.55E-03		Eu-155	1.91E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	2.92E-02		Pm-147	1.79E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	5.00E-03		Rh-106	1.61E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Rn-219	1.74E-10	
			Ru-106	3.74E-03		Ru-106	1.63E-11	
			Sb-125	2.08E-02		Sb-125	1.88E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.40E-01	
			Te-125m	8.63E-03		Te-125m	4.56E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.37E-01	
207	S811400	1981			2009	Ac-227	1.76E-10	290,000
			Ba-137m	8.39E-01		Ba-137m	4.38E-01	
						Bi-211	1.74E-10	
			Cs-137	8.94E-01		Cs-137	4.68E-01	
			Eu-155	1.67E-02		Eu-155	3.34E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	5.10E-02		Pm-147	3.13E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	8.74E-03		Rh-106	2.82E-11	
						Rn-219	1.74E-10	
			Ru-106	6.55E-03		Ru-106	2.85E-11	
			Sb-125	3.64E-02		Sb-125	3.30E-05	
						Sm-147	1.25E-12	
			Sr-90	8.17E-01		Sr-90	4.20E-01	
			Te-125m	1.51E-02		Te-125m	7.98E-06	
						Th-227	1.71E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	8.16E-01		Y-90	4.15E-01	
207	S811401	1981			2009	Ac-227	1.87E-09	170,000
			Ba-137m	1.23E+00		Ba-137m	6.44E-01	
						Bi-211	1.84E-09	
			Cs-137	1.31E+00		Cs-137	6.89E-01	
			Eu-155	2.46E-02		Eu-155	4.91E-04	
						Fr-223	2.55E-11	
						Pa-231	5.52E-09	
						Pb-211	1.85E-09	
			Pm-147	7.51E-02		Pm-147	4.60E-05	
						Po-211	5.62E-12	
						Po-215	1.85E-09	
			Pu-239	6.57E-02		Pu-239	6.57E-02	
						Ra-223	1.87E-09	
			Rh-106	1.29E-02		Rh-106	4.15E-11	
						Rn-219	1.84E-09	
			Ru-106	9.64E-03		Ru-106	4.19E-11	
			Sb-125	5.35E-02		Sb-125	4.85E-05	
						Sm-147	1.84E-12	
			Sr-90	1.20E+00		Sr-90	6.17E-01	
			Te-125m	2.22E-02		Te-125m	1.17E-05	
						Th-227	1.82E-09	
						Th-231	9.21E-06	
						Tl-207	1.83E-09	
			U-235	9.33E-06		U-235	9.33E-06	
			Y-90	1.20E+00		Y-90	6.10E-01	
207	S811406	1981			2009	Ac-227	1.76E-10	150,000
			Ba-137m	5.99E-01		Ba-137m	3.13E-01	
						Bi-211	1.74E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Cs-137	6.38E-01		Cs-137	3.34E-01	
			Eu-155	1.19E-02		Eu-155	2.39E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	3.65E-02		Pm-147	2.23E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	6.24E-03		Rh-106	2.01E-11	
						Rn-219	1.74E-10	
			Ru-106	4.68E-03		Ru-106	2.03E-11	
			Sb-125	2.60E-02		Sb-125	2.35E-05	
						Sm-147	8.94E-13	
			Sr-90	5.84E-01		Sr-90	3.00E-01	
			Te-125m	1.08E-02		Te-125m	5.70E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	5.83E-01		Y-90	2.96E-01	
207	S814978	1981			2009	Ac-227	1.06E-10	3,600
			Ba-137m	4.31E-02		Ba-137m	2.25E-02	
						Bi-211	1.04E-10	
			Cs-137	4.60E-02		Cs-137	2.41E-02	
			Eu-155	8.60E-04		Eu-155	1.72E-05	
						Fr-223	1.44E-12	
						Pa-231	3.12E-10	
						Pb-211	1.04E-10	
			Pm-147	2.63E-03		Pm-147	1.61E-06	
						Po-211	3.18E-13	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-215	1.04E-10	
			Pu-239	3.72E-03		Pu-239	3.72E-03	
						Ra-223	1.06E-10	
			Rh-106	4.50E-04		Rh-106	1.45E-12	
						Rn-219	1.04E-10	
			Ru-106	3.37E-04		Ru-106	1.46E-12	
			Sb-125	1.87E-03		Sb-125	1.70E-06	
						Sm-147	6.43E-14	
			Sr-90	4.20E-02		Sr-90	2.16E-02	
			Te-125m	7.77E-04		Te-125m	4.10E-07	
						Th-227	1.03E-10	
						Th-231	5.22E-07	
						Tl-207	1.04E-10	
			U-235	5.28E-07		U-235	5.28E-07	
			Y-90	4.20E-02		Y-90	2.13E-02	
208	S810794	1981			2009	Ac-227	4.47E-08	1000000+
			Ba-137m	2.40E+01		Ba-137m	1.25E+01	
						Bi-211	4.41E-08	
			Cs-137	2.55E+01		Cs-137	1.34E+01	
			Eu-155	4.78E-01		Eu-155	9.54E-03	
						Fr-223	6.10E-10	
						Pa-231	1.32E-07	
						Pb-211	4.42E-08	
			Pm-147	1.46E+00		Pm-147	8.93E-04	
						Po-211	1.35E-10	
						Po-215	4.42E-08	
			Pu-239	1.75E+00		Pu-239	1.75E+00	
						Ra-223	4.47E-08	
			Rh-106	2.50E-01		Rh-106	8.06E-10	
						Rn-219	4.41E-08	
			Ru-106	1.87E-01		Ru-106	8.14E-10	
			Sb-125	1.04E+00		Sb-125	9.42E-04	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.20E+01	
			Te-125m	4.32E-01		Te-125m	2.28E-04	
						Th-227	4.35E-08	
						Th-231	2.21E-04	
						Tl-207	4.39E-08	
			U-235	2.23E-04		U-235	2.23E-04	
			Y-90	2.33E+01		Y-90	1.19E+01	
208	S810802	1981			2009	Ac-227	1.76E-10	1,000
			Ba-137m	1.44E-02		Ba-137m	7.50E-03	
						Bi-211	1.74E-10	
			Cs-137	1.53E-02		Cs-137	8.02E-03	
			Eu-155	2.87E-04		Eu-155	5.72E-06	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	8.75E-04		Pm-147	5.36E-07	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	1.50E-04		Rh-106	4.83E-13	
						Rn-219	1.74E-10	
			Ru-106	1.12E-04		Ru-106	4.88E-13	
			Sb-125	6.24E-04		Sb-125	5.65E-07	
						Sm-147	2.14E-14	
			Sr-90	1.40E-02		Sr-90	7.19E-03	
			Te-125m	2.59E-04		Te-125m	1.37E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Y-90	1.40E-02		Y-90	7.11E-03	
208	S811405	1981			2009	Ac-227	8.81E-10	80,000
			Ba-137m	4.79E-01		Ba-137m	2.50E-01	
						Bi-211	8.69E-10	
			Cs-137	5.11E-01		Cs-137	2.67E-01	
			Eu-155	9.55E-03		Eu-155	1.91E-04	
						Fr-223	1.20E-11	
						Pa-231	2.60E-09	
						Pb-211	8.70E-10	
			Pm-147	2.92E-02		Pm-147	1.79E-05	
						Po-211	2.65E-12	
						Po-215	8.71E-10	
			Pu-239	3.10E-02		Pu-239	3.10E-02	
						Ra-223	8.80E-10	
			Rh-106	5.00E-03		Rh-106	1.61E-11	
						Rn-219	8.69E-10	
			Ru-106	3.74E-03		Ru-106	1.63E-11	
			Sb-125	2.08E-02		Sb-125	1.88E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.40E-01	
			Te-125m	8.63E-03		Te-125m	4.56E-06	
						Th-227	8.57E-10	
						Th-231	4.35E-06	
						Tl-207	8.65E-10	
			U-235	4.40E-06		U-235	4.40E-06	
			Y-90	4.66E-01		Y-90	2.37E-01	
208	S811408	1981			2009	Ac-227	1.76E-10	1,500
			Ba-137m	1.92E-02		Ba-137m	1.00E-02	
						Bi-211	1.74E-10	
			Cs-137	2.04E-02		Cs-137	1.07E-02	
			Eu-155	3.82E-04		Eu-155	7.63E-06	
						Fr-223	2.40E-12	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	1.17E-03		Pm-147	7.15E-07	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	2.00E-04		Rh-106	6.44E-13	
						Rn-219	1.74E-10	
			Ru-106	1.50E-04		Ru-106	6.51E-13	
			Sb-125	8.32E-04		Sb-125	7.53E-07	
						Sm-147	2.86E-14	
			Sr-90	1.87E-02		Sr-90	9.59E-03	
			Te-125m	3.45E-04		Te-125m	1.82E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.87E-02		Y-90	9.48E-03	
208	S811409	1981			2009	Ac-227	1.76E-10	32,000
			Ba-137m	5.03E-01		Ba-137m	2.63E-01	
						Bi-211	1.74E-10	
			Cs-137	5.36E-01		Cs-137	2.81E-01	
			Eu-155	1.00E-02		Eu-155	2.00E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	3.06E-02		Pm-147	1.88E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Rh-106	5.24E-03		Rh-106	1.69E-11	
						Rn-219	1.74E-10	
			Ru-106	3.93E-03		Ru-106	1.71E-11	
			Sb-125	2.18E-02		Sb-125	1.98E-05	
						Sm-147	7.50E-13	
			Sr-90	4.90E-01		Sr-90	2.52E-01	
			Te-125m	9.07E-03		Te-125m	4.79E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.90E-01		Y-90	2.49E-01	
208	S811411	1981			2009	Ac-227	1.76E-10	29,000
			Ba-137m	2.40E-01		Ba-137m	1.25E-01	
						Bi-211	1.74E-10	
			Cs-137	2.55E-01		Cs-137	1.34E-01	
			Eu-155	4.78E-03		Eu-155	9.54E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	1.46E-02		Pm-147	8.93E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	2.50E-03		Rh-106	8.06E-12	
						Rn-219	1.74E-10	
			Ru-106	1.87E-03		Ru-106	8.14E-12	
			Sb-125	1.04E-02		Sb-125	9.42E-06	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.20E-01	
			Te-125m	4.32E-03		Te-125m	2.28E-06	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.19E-01	
208	S814979	1981			2009	Ac-227	7.04E-11	15,000
			Ba-137m	2.88E-02		Ba-137m	1.50E-02	
						Bi-211	6.95E-11	
			Cs-137	3.06E-02		Cs-137	1.60E-02	
			Eu-155	5.73E-04		Eu-155	1.14E-05	
						Fr-223	9.61E-13	
						Pa-231	2.08E-10	
						Pb-211	6.96E-11	
			Pm-147	1.75E-03		Pm-147	1.07E-06	
						Po-211	2.12E-13	
						Po-215	6.96E-11	
			Pu-239	2.48E-03		Pu-239	2.48E-03	
						Ra-223	7.04E-11	
			Rh-106	3.00E-04		Rh-106	9.67E-13	
						Rn-219	6.95E-11	
			Ru-106	2.25E-04		Ru-106	9.76E-13	
			Sb-125	1.25E-03		Sb-125	1.13E-06	
						Sm-147	4.29E-14	
			Sr-90	2.80E-02		Sr-90	1.44E-02	
			Te-125m	5.18E-04		Te-125m	2.74E-07	
						Th-227	6.86E-11	
						Th-231	3.48E-07	
						Tl-207	6.92E-11	
			U-235	3.52E-07		U-235	3.52E-07	
			Y-90	2.80E-02		Y-90	1.42E-02	
209	S810787	1981			2009	Ac-227	1.76E-10	2,400
			Ba-137m	9.59E-02		Ba-137m	5.00E-02	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-211	1.74E-10	
			Cs-137	1.02E-01		Cs-137	5.35E-02	
			Eu-155	1.91E-03		Eu-155	3.82E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	5.83E-03		Pm-147	3.57E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	9.99E-04		Rh-106	3.22E-12	
						Rn-219	1.74E-10	
			Ru-106	7.49E-04		Ru-106	3.25E-12	
			Sb-125	4.16E-03		Sb-125	3.77E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	4.80E-02	
			Te-125m	1.73E-03		Te-125m	9.12E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	4.74E-02	
209	S810795	1981			2009	Ac-227	1.76E-10	2,800
			Ba-137m	2.40E-01		Ba-137m	1.25E-01	
						Bi-211	1.74E-10	
			Cs-137	2.55E-01		Cs-137	1.34E-01	
			Eu-155	4.78E-03		Eu-155	9.54E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	1.46E-02		Pm-147	8.93E-06	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	2.50E-03		Rh-106	8.06E-12	
						Rn-219	1.74E-10	
			Ru-106	1.87E-03		Ru-106	8.14E-12	
			Sb-125	1.04E-02		Sb-125	9.42E-06	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.20E-01	
			Te-125m	4.32E-03		Te-125m	2.28E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.19E-01	
209	S810798	1981			2009	Ac-227	1.76E-10	1,600
			Ba-137m	4.79E-02		Ba-137m	2.50E-02	
						Bi-211	1.74E-10	
			Cs-137	5.11E-02		Cs-137	2.67E-02	
			Eu-155	9.55E-04		Eu-155	1.91E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	2.92E-03		Pm-147	1.79E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	5.00E-04		Rh-106	1.61E-12	
						Rn-219	1.74E-10	
			Ru-106	3.74E-04		Ru-106	1.63E-12	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sb-125	2.08E-03		Sb-125	1.88E-06	
						Sm-147	7.15E-14	
			Sr-90	4.67E-02		Sr-90	2.40E-02	
			Te-125m	8.63E-04		Te-125m	4.56E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-02		Y-90	2.37E-02	
209	S810799	1981			2009	Ac-227	1.76E-10	5,000
			Ba-137m	7.19E-02		Ba-137m	3.75E-02	
						Bi-211	1.74E-10	
			Cs-137	7.66E-02		Cs-137	4.01E-02	
			Eu-155	1.43E-03		Eu-155	2.86E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	4.38E-03		Pm-147	2.68E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	7.49E-04		Rh-106	2.42E-12	
						Rn-219	1.74E-10	
			Ru-106	5.62E-04		Ru-106	2.44E-12	
			Sb-125	3.12E-03		Sb-125	2.82E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.60E-02	
			Te-125m	1.30E-03		Te-125m	6.84E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.56E-02	
209	S811412	1981			2009	Ac-227	1.76E-10	90,000
			Ba-137m	4.79E-01		Ba-137m	2.50E-01	
						Bi-211	1.74E-10	
			Cs-137	5.11E-01		Cs-137	2.67E-01	
			Eu-155	9.55E-03		Eu-155	1.91E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	2.92E-02		Pm-147	1.79E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	5.00E-03		Rh-106	1.61E-11	
						Rn-219	1.74E-10	
			Ru-106	3.74E-03		Ru-106	1.63E-11	
			Sb-125	2.08E-02		Sb-125	1.88E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.40E-01	
			Te-125m	8.63E-03		Te-125m	4.56E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.37E-01	
210	S810800	1981			2009	Ac-227	1.76E-10	10,000
			Ba-137m	9.59E-02		Ba-137m	5.00E-02	
						Bi-211	1.74E-10	
			Cs-137	1.02E-01		Cs-137	5.35E-02	
			Eu-155	1.91E-03		Eu-155	3.82E-05	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	5.83E-03		Pm-147	3.57E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	9.99E-04		Rh-106	3.22E-12	
						Rn-219	1.74E-10	
			Ru-106	7.49E-04		Ru-106	3.25E-12	
			Sb-125	4.16E-03		Sb-125	3.77E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	4.80E-02	
			Te-125m	1.73E-03		Te-125m	9.12E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	4.74E-02	
210	S810804	1981			2009	Ac-227	1.76E-10	4,000
			Ba-137m	4.79E-02		Ba-137m	2.50E-02	
						Bi-211	1.74E-10	
			Cs-137	5.11E-02		Cs-137	2.67E-02	
			Eu-155	9.55E-04		Eu-155	1.91E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	2.92E-03		Pm-147	1.79E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	1.76E-10	
			Rh-106	5.00E-04		Rh-106	1.61E-12	
						Rn-219	1.74E-10	
			Ru-106	3.74E-04		Ru-106	1.63E-12	
			Sb-125	2.08E-03		Sb-125	1.88E-06	
						Sm-147	7.15E-14	
			Sr-90	4.67E-02		Sr-90	2.40E-02	
			Te-125m	8.63E-04		Te-125m	4.56E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-02		Y-90	2.37E-02	
210	S810805	1981			2009	Ac-227	1.76E-10	5,000
			Ba-137m	7.19E-02		Ba-137m	3.75E-02	
						Bi-211	1.74E-10	
			Cs-137	7.66E-02		Cs-137	4.01E-02	
			Eu-155	1.43E-03		Eu-155	2.86E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	4.38E-03		Pm-147	2.68E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	7.49E-04		Rh-106	2.42E-12	
						Rn-219	1.74E-10	
			Ru-106	5.62E-04		Ru-106	2.44E-12	
			Sb-125	3.12E-03		Sb-125	2.82E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.60E-02	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	1.30E-03		Te-125m	6.84E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.56E-02	
210	S810806	1981			2009	Ac-227	1.76E-10	300
			Ba-137m	4.79E-03		Ba-137m	2.50E-03	
						Bi-211	1.74E-10	
			Cs-137	5.11E-03		Cs-137	2.67E-03	
			Eu-155	9.55E-05		Eu-155	1.91E-06	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	2.92E-04		Pm-147	1.79E-07	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	5.00E-05		Rh-106	1.61E-13	
						Rn-219	1.74E-10	
			Ru-106	3.74E-05		Ru-106	1.63E-13	
			Sb-125	2.08E-04		Sb-125	1.88E-07	
						Sm-147	7.15E-15	
			Sr-90	4.67E-03		Sr-90	2.40E-03	
			Te-125m	8.63E-05		Te-125m	4.56E-08	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-03		Y-90	2.37E-03	
211	S810807	1981			2009	Ac-227	1.76E-10	16,000

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	1.68E-01		Ba-137m	8.75E-02	
						Bi-211	1.74E-10	
			Cs-137	1.79E-01		Cs-137	9.35E-02	
			Eu-155	3.34E-03		Eu-155	6.68E-05	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	1.02E-02		Pm-147	6.25E-06	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	1.75E-03		Rh-106	5.64E-12	
						Rn-219	1.74E-10	
			Ru-106	1.31E-03		Ru-106	5.70E-12	
			Sb-125	7.28E-03		Sb-125	6.59E-06	
						Sm-147	2.50E-13	
			Sr-90	1.63E-01		Sr-90	8.39E-02	
			Te-125m	3.02E-03		Te-125m	1.60E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.63E-01		Y-90	8.30E-02	
211	S810808	1981			2009	Ac-227	1.76E-10	126,000
			Ba-137m	5.27E-01		Ba-137m	2.75E-01	
						Bi-211	1.74E-10	
			Cs-137	5.62E-01		Cs-137	2.94E-01	
			Eu-155	1.05E-02		Eu-155	2.10E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	3.21E-02		Pm-147	1.97E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	5.49E-03		Rh-106	1.77E-11	
						Rn-219	1.74E-10	
			Ru-106	4.12E-03		Ru-106	1.79E-11	
			Sb-125	2.29E-02		Sb-125	2.07E-05	
						Sm-147	7.86E-13	
			Sr-90	5.14E-01		Sr-90	2.64E-01	
			Te-125m	9.50E-03		Te-125m	5.01E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	5.13E-01		Y-90	2.61E-01	
211	S810809	1981			2009	Ac-227	1.76E-10	160,000
			Ba-137m	9.59E-01		Ba-137m	5.00E-01	
						Bi-211	1.74E-10	
			Cs-137	1.02E+00		Cs-137	5.35E-01	
			Eu-155	1.91E-02		Eu-155	3.82E-04	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	5.83E-02		Pm-147	3.57E-05	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	9.99E-03		Rh-106	3.22E-11	
						Rn-219	1.74E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	7.49E-03		Ru-106	3.25E-11	
			Sb-125	4.16E-02		Sb-125	3.77E-05	
						Sm-147	1.43E-12	
			Sr-90	9.34E-01		Sr-90	4.80E-01	
			Te-125m	1.73E-02		Te-125m	9.12E-06	
						Th-227	1.71E-10	
						Th-231	8.69E-07	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-01		Y-90	4.74E-01	
211	S810810	1981			2009	Ac-227	1.76E-10	1,000
			Ba-137m	1.44E-02		Ba-137m	7.50E-03	
						Bi-211	1.74E-10	
			Cs-137	1.53E-02		Cs-137	8.02E-03	
			Eu-155	2.87E-04		Eu-155	5.72E-06	
						Fr-223	2.40E-12	
						Pa-231	5.21E-10	
						Pb-211	1.74E-10	
			Pm-147	8.75E-04		Pm-147	5.36E-07	
						Po-211	5.31E-13	
						Po-215	1.74E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.76E-10	
			Rh-106	1.50E-04		Rh-106	4.83E-13	
						Rn-219	1.74E-10	
			Ru-106	1.12E-04		Ru-106	4.88E-13	
			Sb-125	6.24E-04		Sb-125	5.65E-07	
						Sm-147	2.14E-14	
			Sr-90	1.40E-02		Sr-90	7.19E-03	
			Te-125m	2.59E-04		Te-125m	1.37E-07	
						Th-227	1.71E-10	
						Th-231	8.69E-07	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Tl-207	1.73E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.40E-02		Y-90	7.11E-03	
211	S812669	1981			2009	Ac-227	1.14E-08	940,000
			Ba-137m	2.64E+00		Ba-137m	1.38E+00	
						Bi-211	1.13E-08	
			Cs-137	2.81E+00		Cs-137	1.47E+00	
			Eu-155	5.26E-02		Eu-155	1.05E-03	
						Fr-223	1.56E-10	
						Pa-231	3.38E-08	
						Pb-211	1.13E-08	
			Pm-147	1.60E-01		Pm-147	9.83E-05	
						Po-211	3.45E-11	
						Po-215	1.13E-08	
			Pu-239	4.07E-01		Pu-239	4.06E-01	
						Ra-223	1.14E-08	
			Rh-106	2.75E-02		Rh-106	8.86E-11	
						Rn-219	1.13E-08	
			Ru-106	2.06E-02		Ru-106	8.95E-11	
			Sb-125	1.14E-01		Sb-125	1.04E-04	
						Sm-147	3.93E-12	
			Sr-90	2.57E+00		Sr-90	1.32E+00	
			Te-125m	4.75E-02		Te-125m	2.51E-05	
						Th-227	1.11E-08	
						Th-231	5.65E-05	
						Tl-207	1.13E-08	
			U-235	5.72E-05		U-235	5.72E-05	
			Y-90	2.56E+00		Y-90	1.30E+00	
212	S803758	1980			2009	Ac-227	2.69E-11	1,750
						Bi-211	2.66E-11	
			Co-60	3.00E+01		Co-60	6.61E-01	
						Fr-223	3.68E-13	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	1.09E-10	
						Pb-211	2.66E-11	
						Po-211	8.12E-14	
						Po-215	2.66E-11	
			Pu-239	1.24E+01		Pu-239	1.24E+01	
						Ra-223	2.69E-11	
						Rn-219	2.66E-11	
						Th-227	2.62E-11	
						Th-231	3.50E-07	
						Tl-207	2.65E-11	
						U-235	3.55E-07	
213	S812684	1981			2009	Ac-227	6.07E-08	1000000+
			Ba-137m	9.78E+00		Ba-137m	5.10E+00	
						Bi-211	6.00E-08	
			Cs-137	1.04E+01		Cs-137	5.45E+00	
			Eu-155	1.95E-01		Eu-155	3.89E-03	
						Fr-223	8.29E-10	
						Pa-231	1.80E-07	
						Pb-211	6.00E-08	
			Pm-147	5.95E-01		Pm-147	3.65E-04	
						Po-211	1.83E-10	
						Po-215	6.01E-08	
			Pu-239	2.02E+00		Pu-239	2.02E+00	
						Ra-223	6.07E-08	
			Rh-106	1.02E-01		Rh-106	3.29E-10	
						Rn-219	6.00E-08	
			Ru-106	7.64E-02		Ru-106	3.32E-10	
			Sb-125	4.24E-01		Sb-125	3.84E-04	
						Sm-147	1.46E-11	
			Sr-90	9.52E+00		Sr-90	4.89E+00	
			Te-125m	1.76E-01		Te-125m	9.30E-05	
						Th-227	5.91E-08	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-231	3.00E-04	
						Tl-207	5.97E-08	
			U-235	3.04E-04		U-235	3.04E-04	
			Y-90	9.51E+00		Y-90	4.84E+00	
213	S812686	1981			2009	Ac-227	7.61E-09	500,000
			Ba-137m	1.68E+00		Ba-137m	8.75E-01	
						Bi-211	7.52E-09	
			Cs-137	1.79E+00		Cs-137	9.35E-01	
			Eu-155	3.34E-02		Eu-155	6.68E-04	
						Fr-223	1.04E-10	
						Pa-231	2.25E-08	
						Pb-211	7.53E-09	
			Pm-147	1.02E-01		Pm-147	6.25E-05	
						Po-211	2.30E-11	
						Po-215	7.53E-09	
			Pu-239	2.68E-01		Pu-239	2.68E-01	
						Ra-223	7.61E-09	
			Rh-106	1.75E-02		Rh-106	5.64E-11	
						Rn-219	7.52E-09	
			Ru-106	1.31E-02		Ru-106	5.70E-11	
			Sb-125	7.28E-02		Sb-125	6.59E-05	
						Sm-147	2.50E-12	
			Sr-90	1.63E+00		Sr-90	8.39E-01	
			Te-125m	3.02E-02		Te-125m	1.60E-05	
						Th-227	7.41E-09	
						Th-231	3.76E-05	
						Tl-207	7.49E-09	
			U-235	3.81E-05		U-235	3.81E-05	
			Y-90	1.63E+00		Y-90	8.30E-01	
213	S812688	1981			2009	Ac-227	3.43E-08	
			Ba-137m	2.42E+01		Ba-137m	1.26E+01	
						Bi-211	3.39E-08	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Cs-137	2.58E+01		Cs-137	1.35E+01	
			Eu-155	4.83E-01		Eu-155	9.64E-03	
						Fr-223	4.68E-10	
						Pa-231	1.01E-07	
						Pb-211	3.39E-08	
			Pm-147	1.47E+00		Pm-147	9.02E-04	
						Po-211	1.03E-10	
						Po-215	3.39E-08	
			Pu-239	7.95E-01		Pu-239	7.94E-01	
						Ra-223	3.43E-08	
			Rh-106	2.52E-01		Rh-106	8.13E-10	
						Rn-219	3.39E-08	
			Ru-106	1.89E-01		Ru-106	8.22E-10	
			Sb-125	1.05E+00		Sb-125	9.51E-04	
						Sm-147	3.61E-11	
			Sr-90	2.36E+01		Sr-90	1.21E+01	
			Te-125m	4.36E-01		Te-125m	2.30E-04	
						Th-227	3.34E-08	
						Th-231	1.69E-04	
						Tl-207	3.37E-08	
			U-235	1.71E-04		U-235	1.71E-04	
			Y-90	2.35E+01		Y-90	1.20E+01	
213	S812689	1981			2009	Ac-227	4.40E-09	160,000
			Ba-137m	6.71E-01		Ba-137m	3.50E-01	
						Bi-211	4.35E-09	
			Cs-137	7.15E-01		Cs-137	3.74E-01	
			Eu-155	1.34E-02		Eu-155	2.67E-04	
						Fr-223	6.01E-11	
						Pa-231	1.30E-08	
						Pb-211	4.35E-09	
			Pm-147	4.08E-02		Pm-147	2.50E-05	
						Po-211	1.33E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-215	4.35E-09	
			Pu-239	1.24E-02		Pu-239	1.24E-02	
						Ra-223	4.40E-09	
			Rh-106	6.99E-03		Rh-106	2.26E-11	
						Rn-219	4.35E-09	
			Ru-106	5.24E-03		Ru-106	2.28E-11	
			Sb-125	2.91E-02		Sb-125	2.64E-05	
						Sm-147	1.00E-12	
			Sr-90	6.54E-01		Sr-90	3.36E-01	
			Te-125m	1.21E-02		Te-125m	6.38E-06	
						Th-227	4.29E-09	
						Th-231	2.17E-05	
						Tl-207	4.33E-09	
			U-235	2.20E-05		U-235	2.20E-05	
			Y-90	6.53E-01		Y-90	3.32E-01	
214	S820057	1982			2009	Ac-227	1.65E-10	15,000
			Ba-137m	7.19E-02		Ba-137m	3.84E-02	
						Bi-211	1.63E-10	
			Cs-137	7.66E-02		Cs-137	4.10E-02	
			Eu-155	1.43E-03		Eu-155	3.29E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	4.38E-03		Pm-147	3.49E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	7.49E-04		Rh-106	4.81E-12	
						Rn-219	1.63E-10	
			Ru-106	5.62E-04		Ru-106	4.85E-12	
			Sb-125	3.12E-03		Sb-125	3.63E-06	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.68E-02	
			Te-125m	1.30E-03		Te-125m	8.79E-07	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.64E-02	
214	S820058	1982			2009	Ac-227	1.65E-10	4,000
			Ba-137m	2.88E-02		Ba-137m	1.54E-02	
						Bi-211	1.63E-10	
			Cs-137	3.06E-02		Cs-137	1.64E-02	
			Eu-155	5.73E-04		Eu-155	1.32E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	1.75E-03		Pm-147	1.40E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	3.00E-04		Rh-106	1.92E-12	
						Rn-219	1.63E-10	
			Ru-106	2.25E-04		Ru-106	1.94E-12	
			Sb-125	1.25E-03		Sb-125	1.45E-06	
						Sm-147	4.29E-14	
			Sr-90	2.80E-02		Sr-90	1.47E-02	
			Te-125m	5.18E-04		Te-125m	3.52E-07	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Y-90	2.80E-02		Y-90	1.46E-02	
214	S821822	1982			2009	Ac-227	1.65E-10	25,000
			Ba-137m	9.59E-02		Ba-137m	5.12E-02	
						Bi-211	1.63E-10	
			Cs-137	1.02E-01		Cs-137	5.47E-02	
			Eu-155	1.91E-03		Eu-155	4.39E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	5.83E-03		Pm-147	4.65E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	9.99E-04		Rh-106	6.41E-12	
						Rn-219	1.63E-10	
			Ru-106	7.49E-04		Ru-106	6.47E-12	
			Sb-125	4.16E-03		Sb-125	4.85E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	4.91E-02	
			Te-125m	1.73E-03		Te-125m	1.18E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	4.85E-02	
214	S821823	1982			2009	Ac-227	1.65E-10	30,000
			Ba-137m	1.08E-01		Ba-137m	5.76E-02	
						Bi-211	1.63E-10	
			Cs-137	1.15E-01		Cs-137	6.16E-02	
			Eu-155	2.15E-03		Eu-155	4.94E-05	
						Fr-223	2.25E-12	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	6.56E-03		Pm-147	5.24E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	1.12E-03		Rh-106	7.21E-12	
						Rn-219	1.63E-10	
			Ru-106	8.43E-04		Ru-106	7.28E-12	
			Sb-125	4.68E-03		Sb-125	5.44E-06	
						Sm-147	1.61E-13	
			Sr-90	1.05E-01		Sr-90	5.52E-02	
			Te-125m	1.94E-03		Te-125m	1.32E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.05E-01		Y-90	5.46E-02	
214	S821826	1982			2009	Ac-227	1.65E-10	20,000
			Ba-137m	9.59E-02		Ba-137m	5.12E-02	
						Bi-211	1.63E-10	
			Cs-137	1.02E-01		Cs-137	5.47E-02	
			Eu-155	1.91E-03		Eu-155	4.39E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	5.83E-03		Pm-147	4.65E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Rh-106	9.99E-04		Rh-106	6.41E-12	
						Rn-219	1.63E-10	
			Ru-106	7.49E-04		Ru-106	6.47E-12	
			Sb-125	4.16E-03		Sb-125	4.85E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	4.91E-02	
			Te-125m	1.73E-03		Te-125m	1.18E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	4.85E-02	
214	S823410	1982			2009	Ac-227	1.65E-10	110,000
			Ba-137m	3.12E-01		Ba-137m	1.66E-01	
						Bi-211	1.63E-10	
			Cs-137	3.32E-01		Cs-137	1.78E-01	
			Eu-155	6.21E-03		Eu-155	1.43E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	1.90E-02		Pm-147	1.51E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	3.25E-03		Rh-106	2.08E-11	
						Rn-219	1.63E-10	
			Ru-106	2.43E-03		Ru-106	2.10E-11	
			Sb-125	1.35E-02		Sb-125	1.57E-05	
						Sm-147	4.65E-13	
			Sr-90	3.03E-01		Sr-90	1.60E-01	
			Te-125m	5.61E-03		Te-125m	3.81E-06	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.03E-01		Y-90	1.58E-01	
215	S820041	1982			2009	Ac-227	2.94E-08	1000000+
			Ba-137m	7.19E+00		Ba-137m	3.84E+00	
						Bi-211	2.90E-08	
			Cs-137	7.66E+00		Cs-137	4.10E+00	
			Eu-155	1.43E-01		Eu-155	3.29E-03	
						Fr-223	4.01E-10	
						Pa-231	8.93E-08	
						Pb-211	2.91E-08	
			Pm-147	4.38E-01		Pm-147	3.49E-04	
						Po-211	8.86E-11	
						Po-215	2.91E-08	
			Pu-239	9.30E-01		Pu-239	9.29E-01	
						Ra-223	2.94E-08	
			Rh-106	7.49E-02		Rh-106	4.81E-10	
						Rn-219	2.90E-08	
			Ru-106	5.62E-02		Ru-106	4.85E-10	
			Sb-125	3.12E-01		Sb-125	3.60E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.68E+00	
			Te-125m	1.30E-01		Te-125m	8.78E-05	
						Th-227	2.86E-08	
						Th-231	1.55E-04	
						Tl-207	2.89E-08	
			U-235	1.57E-04		U-235	1.57E-04	
			Y-90	6.99E+00		Y-90	3.64E+00	
215	S820042	1982			2009	Ac-227	1.65E-10	140,000
			Ba-137m	3.59E+00		Ba-137m	1.92E+00	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-211	1.63E-10	
			Cs-137	3.83E+00		Cs-137	2.05E+00	
			Eu-155	7.17E-02		Eu-155	1.65E-03	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.19E-01		Pm-147	1.75E-04	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	3.75E-02		Rh-106	2.40E-10	
						Rn-219	1.63E-10	
			Ru-106	2.81E-02		Ru-106	2.43E-10	
			Sb-125	1.56E-01		Sb-125	1.80E-04	
						Sm-147	5.36E-12	
			Sr-90	3.50E+00		Sr-90	1.84E+00	
			Te-125m	6.48E-02		Te-125m	4.39E-05	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E+00		Y-90	1.82E+00	
215	S821832	1982			2009	Ac-227	1.65E-10	35,000
			Ba-137m	4.79E-01		Ba-137m	2.56E-01	
						Bi-211	1.63E-10	
			Cs-137	5.11E-01		Cs-137	2.74E-01	
			Eu-155	9.55E-03		Eu-155	2.19E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-02		Pm-147	2.33E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-03		Rh-106	3.20E-11	
						Rn-219	1.63E-10	
			Ru-106	3.74E-03		Ru-106	3.24E-11	
			Sb-125	2.08E-02		Sb-125	2.41E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.46E-01	
			Te-125m	8.63E-03		Te-125m	5.86E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.43E-01	
215	S821833	1982			2009	Ac-227	1.65E-10	100,000
			Ba-137m	7.19E-01		Ba-137m	3.84E-01	
						Bi-211	1.63E-10	
			Cs-137	7.66E-01		Cs-137	4.10E-01	
			Eu-155	1.43E-02		Eu-155	3.29E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	4.38E-02		Pm-147	3.49E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	7.49E-03		Rh-106	4.81E-11	
						Rn-219	1.63E-10	
			Ru-106	5.62E-03		Ru-106	4.85E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sb-125	3.12E-02		Sb-125	3.65E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.68E-01	
			Te-125m	1.30E-02		Te-125m	8.83E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-01		Y-90	3.64E-01	
215	S821834	1982			2009	Ac-227	1.65E-10	200,000
			Ba-137m	4.79E-01		Ba-137m	2.56E-01	
						Bi-211	1.63E-10	
			Cs-137	5.11E-01		Cs-137	2.74E-01	
			Eu-155	9.55E-03		Eu-155	2.19E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-02		Pm-147	2.33E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-03		Rh-106	3.20E-11	
						Rn-219	1.63E-10	
			Ru-106	3.74E-03		Ru-106	3.24E-11	
			Sb-125	2.08E-02		Sb-125	2.41E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.46E-01	
			Te-125m	8.63E-03		Te-125m	5.86E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.43E-01	
215	S821835	1982			2009	Ac-227	1.65E-10	40,000
			Ba-137m	7.19E-02		Ba-137m	3.84E-02	
						Bi-211	1.63E-10	
			Cs-137	7.66E-02		Cs-137	4.10E-02	
			Eu-155	1.43E-03		Eu-155	3.29E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	4.38E-03		Pm-147	3.49E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	7.49E-04		Rh-106	4.81E-12	
						Rn-219	1.63E-10	
			Ru-106	5.62E-04		Ru-106	4.85E-12	
			Sb-125	3.12E-03		Sb-125	3.63E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.68E-02	
			Te-125m	1.30E-03		Te-125m	8.79E-07	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.64E-02	
215	S821837	1982			2009	Ac-227	1.65E-10	20,000
			Ba-137m	4.79E-01		Ba-137m	2.56E-01	
						Bi-211	1.63E-10	
			Cs-137	5.11E-01		Cs-137	2.74E-01	
			Eu-155	9.55E-03		Eu-155	2.19E-04	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-02		Pm-147	2.33E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-03		Rh-106	3.20E-11	
						Rn-219	1.63E-10	
			Ru-106	3.74E-03		Ru-106	3.24E-11	
			Sb-125	2.08E-02		Sb-125	2.41E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.46E-01	
			Te-125m	8.63E-03		Te-125m	5.86E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.43E-01	
216	S821825	1982			2009	Ac-227	1.65E-09	40,000
			Ba-137m	1.92E-01		Ba-137m	1.02E-01	
						Bi-211	1.63E-09	
			Cs-137	2.04E-01		Cs-137	1.09E-01	
			Eu-155	3.82E-03		Eu-155	8.77E-05	
						Fr-223	2.25E-11	
						Pa-231	5.02E-09	
						Pb-211	1.63E-09	
			Pm-147	1.17E-02		Pm-147	9.31E-06	
						Po-211	4.98E-12	
						Po-215	1.63E-09	
			Pu-239	6.20E-02		Pu-239	6.20E-02	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	1.65E-09	
			Rh-106	2.00E-03		Rh-106	1.28E-11	
						Rn-219	1.63E-09	
			Ru-106	1.50E-03		Ru-106	1.29E-11	
			Sb-125	8.32E-03		Sb-125	9.71E-06	
						Sm-147	2.86E-13	
			Sr-90	1.87E-01		Sr-90	9.82E-02	
			Te-125m	3.45E-03		Te-125m	2.35E-06	
						Th-227	1.61E-09	
						Th-231	8.69E-06	
						Tl-207	1.62E-09	
			U-235	8.80E-06		U-235	8.80E-06	
			Y-90	1.87E-01		Y-90	9.71E-02	
216	S821836	1982			2009	Ac-227	1.65E-10	20,000
			Ba-137m	4.79E-01		Ba-137m	2.56E-01	
						Bi-211	1.63E-10	
			Cs-137	5.11E-01		Cs-137	2.74E-01	
			Eu-155	9.55E-03		Eu-155	2.19E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-02		Pm-147	2.33E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-03		Rh-106	3.20E-11	
						Rn-219	1.63E-10	
			Ru-106	3.74E-03		Ru-106	3.24E-11	
			Sb-125	2.08E-02		Sb-125	2.41E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.46E-01	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	8.63E-03		Te-125m	5.86E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.43E-01	
216	S821838	1982			2009	Ac-227	1.65E-10	15,000
			Ba-137m	2.40E-01		Ba-137m	1.28E-01	
						Bi-211	1.63E-10	
			Cs-137	2.55E-01		Cs-137	1.37E-01	
			Eu-155	4.78E-03		Eu-155	1.10E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	1.46E-02		Pm-147	1.16E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	2.50E-03		Rh-106	1.60E-11	
						Rn-219	1.63E-10	
			Ru-106	1.87E-03		Ru-106	1.62E-11	
			Sb-125	1.04E-02		Sb-125	1.21E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.23E-01	
			Te-125m	4.32E-03		Te-125m	2.93E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.21E-01	
216	S821839	1982			2009	Ac-227	1.65E-10	8,000

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	4.79E-02		Ba-137m	2.56E-02	
						Bi-211	1.63E-10	
			Cs-137	5.11E-02		Cs-137	2.74E-02	
			Eu-155	9.55E-04		Eu-155	2.19E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-03		Pm-147	2.33E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-04		Rh-106	3.20E-12	
						Rn-219	1.63E-10	
			Ru-106	3.74E-04		Ru-106	3.24E-12	
			Sb-125	2.08E-03		Sb-125	2.43E-06	
						Sm-147	7.15E-14	
			Sr-90	4.67E-02		Sr-90	2.46E-02	
			Te-125m	8.63E-04		Te-125m	5.88E-07	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-02		Y-90	2.43E-02	
216	S821840	1982			2009	Ac-227	1.65E-10	200,000
			Ba-137m	9.59E-01		Ba-137m	5.12E-01	
						Bi-211	1.63E-10	
			Cs-137	1.02E+00		Cs-137	5.47E-01	
			Eu-155	1.91E-02		Eu-155	4.39E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	5.83E-02		Pm-147	4.65E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	9.99E-03		Rh-106	6.41E-11	
						Rn-219	1.63E-10	
			Ru-106	7.49E-03		Ru-106	6.47E-11	
			Sb-125	4.16E-02		Sb-125	4.83E-05	
						Sm-147	1.43E-12	
			Sr-90	9.34E-01		Sr-90	4.91E-01	
			Te-125m	1.73E-02		Te-125m	1.17E-05	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-01		Y-90	4.85E-01	
216	S821841	1982			2009	Ac-227	1.65E-10	30,000
			Ba-137m	4.79E-01		Ba-137m	2.56E-01	
						Bi-211	1.63E-10	
			Cs-137	5.11E-01		Cs-137	2.74E-01	
			Eu-155	9.55E-03		Eu-155	2.19E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-02		Pm-147	2.33E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-03		Rh-106	3.20E-11	
						Rn-219	1.63E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	3.74E-03		Ru-106	3.24E-11	
			Sb-125	2.08E-02		Sb-125	2.41E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.46E-01	
			Te-125m	8.63E-03		Te-125m	5.86E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.43E-01	
217	S821870	1982			2009	Ac-227	1.65E-10	15,000
			Ba-137m	4.31E-02		Ba-137m	2.30E-02	
						Bi-211	1.63E-10	
			Cs-137	4.60E-02		Cs-137	2.46E-02	
			Eu-155	8.60E-04		Eu-155	1.97E-05	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.63E-03		Pm-147	2.09E-06	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	4.50E-04		Rh-106	2.88E-12	
						Rn-219	1.63E-10	
			Ru-106	3.37E-04		Ru-106	2.91E-12	
			Sb-125	1.87E-03		Sb-125	2.18E-06	
						Sm-147	6.43E-14	
			Sr-90	4.20E-02		Sr-90	2.21E-02	
			Te-125m	7.77E-04		Te-125m	5.28E-07	
						Th-227	1.61E-10	
						Th-231	8.69E-07	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.20E-02		Y-90	2.18E-02	
217	S821871	1982			2009	Ac-227	5.32E-09	100,000
			Ba-137m	1.08E+00		Ba-137m	5.76E-01	
						Bi-211	5.25E-09	
			Cs-137	1.15E+00		Cs-137	6.16E-01	
			Eu-155	2.15E-02		Eu-155	4.94E-04	
						Fr-223	7.25E-11	
						Pa-231	1.62E-08	
						Pb-211	5.26E-09	
			Pm-147	6.56E-02		Pm-147	5.24E-05	
						Po-211	1.60E-11	
						Po-215	5.26E-09	
			Pu-239	1.98E-01		Pu-239	1.98E-01	
						Ra-223	5.31E-09	
			Rh-106	1.12E-02		Rh-106	7.21E-11	
						Rn-219	5.25E-09	
			Ru-106	8.43E-03		Ru-106	7.28E-11	
			Sb-125	4.68E-02		Sb-125	5.46E-05	
						Sm-147	1.61E-12	
			Sr-90	1.05E+00		Sr-90	5.52E-01	
			Te-125m	1.94E-02		Te-125m	1.32E-05	
						Th-227	5.18E-09	
						Th-231	2.80E-05	
						Tl-207	5.23E-09	
			U-235	2.83E-05		U-235	2.83E-05	
			Y-90	1.05E+00		Y-90	5.46E-01	
217	S821874	1982			2009	Ac-227	1.65E-10	80,000
			Ba-137m	2.40E+00		Ba-137m	1.28E+00	
						Bi-211	1.63E-10	
			Cs-137	2.55E+00		Cs-137	1.37E+00	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Eu-155	4.78E-02		Eu-155	1.10E-03	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	1.46E-01		Pm-147	1.16E-04	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	2.50E-02		Rh-106	1.60E-10	
						Rn-219	1.63E-10	
			Ru-106	1.87E-02		Ru-106	1.62E-10	
			Sb-125	1.04E-01		Sb-125	1.20E-04	
						Sm-147	3.57E-12	
			Sr-90	2.33E+00		Sr-90	1.23E+00	
			Te-125m	4.32E-02		Te-125m	2.93E-05	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E+00		Y-90	1.21E+00	
217	S821882	1982			2009	Ac-227	1.65E-10	6,000
			Ba-137m	2.40E-01		Ba-137m	1.28E-01	
						Bi-211	1.63E-10	
			Cs-137	2.55E-01		Cs-137	1.37E-01	
			Eu-155	4.78E-03		Eu-155	1.10E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	1.46E-02		Pm-147	1.16E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	2.50E-03		Rh-106	1.60E-11	
						Rn-219	1.63E-10	
			Ru-106	1.87E-03		Ru-106	1.62E-11	
			Sb-125	1.04E-02		Sb-125	1.21E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.23E-01	
			Te-125m	4.32E-03		Te-125m	2.93E-06	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.21E-01	
217	S821915	1982			2009	Ac-227	2.48E-08	1000000+
			Ba-137m	2.40E-01		Ba-137m	1.28E-01	
						Bi-211	2.45E-08	
			Cs-137	2.55E-01		Cs-137	1.37E-01	
			Eu-155	4.78E-03		Eu-155	1.10E-04	
						Fr-223	3.38E-10	
						Pa-231	7.53E-08	
						Pb-211	2.45E-08	
			Pm-147	1.46E-02		Pm-147	1.16E-05	
						Po-211	7.47E-11	
						Po-215	2.45E-08	
			Pu-239	1.41E+00		Pu-239	1.41E+00	
						Ra-223	2.48E-08	
			Rh-106	2.50E-03		Rh-106	1.60E-11	
						Rn-219	2.45E-08	
			Ru-106	1.87E-03		Ru-106	1.62E-11	
			Sb-125	1.04E-02		Sb-125	1.21E-05	
						Sm-147	3.57E-13	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sr-90	2.33E-01		Sr-90	1.23E-01	
			Te-125m	4.32E-03		Te-125m	2.93E-06	
						Th-227	2.41E-08	
						Th-231	1.30E-04	
						Tl-207	2.44E-08	
			U-235	1.32E-04		U-235	1.32E-04	
			Y-90	2.33E-01		Y-90	1.21E-01	
217	S821918	1982			2009	Ac-227	5.32E-09	900,000
			Ba-137m	2.40E-01		Ba-137m	1.28E-01	
						Bi-211	5.25E-09	
			Cs-137	2.55E-01		Cs-137	1.37E-01	
			Eu-155	4.78E-03		Eu-155	1.10E-04	
						Fr-223	7.25E-11	
						Pa-231	1.62E-08	
						Pb-211	5.26E-09	
			Pm-147	1.46E-02		Pm-147	1.16E-05	
						Po-211	1.60E-11	
						Po-215	5.26E-09	
			Pu-239	1.98E-01		Pu-239	1.98E-01	
						Ra-223	5.31E-09	
			Rh-106	2.50E-03		Rh-106	1.60E-11	
						Rn-219	5.25E-09	
			Ru-106	1.87E-03		Ru-106	1.62E-11	
			Sb-125	1.04E-02		Sb-125	1.21E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.23E-01	
			Te-125m	4.32E-03		Te-125m	2.93E-06	
						Th-227	5.18E-09	
						Th-231	2.80E-05	
						Tl-207	5.23E-09	
			U-235	2.83E-05		U-235	2.83E-05	
			Y-90	2.33E-01		Y-90	1.21E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
218	S821875	1982			2009	Ac-227	1.65E-10	300,000
			Ba-137m	4.79E+00		Ba-137m	2.56E+00	
						Bi-211	1.63E-10	
			Cs-137	5.11E+00		Cs-137	2.74E+00	
			Eu-155	9.55E-02		Eu-155	2.19E-03	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	2.92E-01		Pm-147	2.33E-04	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	5.00E-02		Rh-106	3.20E-10	
						Rn-219	1.63E-10	
			Ru-106	3.74E-02		Ru-106	3.24E-10	
			Sb-125	2.08E-01		Sb-125	2.43E-04	
						Sm-147	7.15E-12	
			Sr-90	4.67E+00		Sr-90	2.46E+00	
			Te-125m	8.63E-02		Te-125m	5.88E-05	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E+00		Y-90	2.43E+00	
218	S821879	1982			2009	Ac-227	3.72E-09	500,000
			Ba-137m	7.19E+00		Ba-137m	3.84E+00	
						Bi-211	3.67E-09	
			Cs-137	7.66E+00		Cs-137	4.10E+00	
			Eu-155	1.43E-01		Eu-155	3.29E-03	
						Fr-223	5.07E-11	
						Pa-231	1.13E-08	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pb-211	3.68E-09	
			Pm-147	4.38E-01		Pm-147	3.49E-04	
						Po-211	1.12E-11	
						Po-215	3.68E-09	
			Pu-239	1.24E-01		Pu-239	1.24E-01	
						Ra-223	3.72E-09	
			Rh-106	7.49E-02		Rh-106	4.81E-10	
						Rn-219	3.67E-09	
			Ru-106	5.62E-02		Ru-106	4.85E-10	
			Sb-125	3.12E-01		Sb-125	3.60E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.68E+00	
			Te-125m	1.30E-01		Te-125m	8.78E-05	
						Th-227	3.62E-09	
						Th-231	1.96E-05	
						Tl-207	3.66E-09	
			U-235	1.98E-05		U-235	1.98E-05	
			Y-90	6.99E+00		Y-90	3.64E+00	
218	S821881	1982			2009	Ac-227	3.72E-09	900,000
			Ba-137m	9.59E+00		Ba-137m	5.12E+00	
						Bi-211	3.67E-09	
			Cs-137	1.02E+01		Cs-137	5.47E+00	
			Eu-155	1.91E-01		Eu-155	4.39E-03	
						Fr-223	5.07E-11	
						Pa-231	1.13E-08	
						Pb-211	3.68E-09	
			Pm-147	5.83E-01		Pm-147	4.65E-04	
						Po-211	1.12E-11	
						Po-215	3.68E-09	
			Pu-239	1.24E-01		Pu-239	1.24E-01	
						Ra-223	3.72E-09	
			Rh-106	9.99E-02		Rh-106	6.41E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Rn-219	3.67E-09	
			Ru-106	7.49E-02		Ru-106	6.47E-10	
			Sb-125	4.16E-01		Sb-125	4.86E-04	
						Sm-147	1.43E-11	
			Sr-90	9.34E+00		Sr-90	4.91E+00	
			Te-125m	1.73E-01		Te-125m	1.18E-04	
						Th-227	3.62E-09	
						Th-231	1.96E-05	
						Tl-207	3.66E-09	
			U-235	1.98E-05		U-235	1.98E-05	
			Y-90	9.33E+00		Y-90	4.85E+00	
218	S821883	1982			2009	Ac-227	1.65E-10	200,000
			Ba-137m	1.44E+00		Ba-137m	7.68E-01	
						Bi-211	1.63E-10	
			Cs-137	1.53E+00		Cs-137	8.21E-01	
			Eu-155	2.87E-02		Eu-155	6.58E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	8.75E-02		Pm-147	6.98E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	1.50E-02		Rh-106	9.61E-11	
						Rn-219	1.63E-10	
			Ru-106	1.12E-02		Ru-106	9.71E-11	
			Sb-125	6.24E-02		Sb-125	7.29E-05	
						Sm-147	2.14E-12	
			Sr-90	1.40E+00		Sr-90	7.37E-01	
			Te-125m	2.59E-02		Te-125m	1.77E-05	
						Th-227	1.61E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.40E+00		Y-90	7.28E-01	
218	S821916	1982			2009	Ac-227	3.42E-08	1000000+
			Ba-137m	7.19E+00		Ba-137m	3.84E+00	
						Bi-211	3.38E-08	
			Cs-137	7.66E+00		Cs-137	4.10E+00	
			Eu-155	1.43E-01		Eu-155	3.29E-03	
						Fr-223	4.67E-10	
						Pa-231	1.04E-07	
						Pb-211	3.38E-08	
			Pm-147	4.38E-01		Pm-147	3.49E-04	
						Po-211	1.03E-10	
						Po-215	3.38E-08	
			Pu-239	2.50E+00		Pu-239	2.50E+00	
						Ra-223	3.42E-08	
			Rh-106	7.49E-02		Rh-106	4.81E-10	
						Rn-219	3.38E-08	
			Ru-106	5.62E-02		Ru-106	4.85E-10	
			Sb-125	3.12E-01		Sb-125	3.60E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.68E+00	
			Te-125m	1.30E-01		Te-125m	8.78E-05	
						Th-227	3.33E-08	
						Th-231	1.80E-04	
						Tl-207	3.36E-08	
			U-235	1.82E-04		U-235	1.82E-04	
			Y-90	6.99E+00		Y-90	3.64E+00	
218	S821917	1982			2009	Ac-227	1.65E-10	300,000
			Ba-137m	1.44E+00		Ba-137m	7.68E-01	
						Bi-211	1.63E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Cs-137	1.53E+00		Cs-137	8.21E-01	
			Eu-155	2.87E-02		Eu-155	6.58E-04	
						Fr-223	2.25E-12	
						Pa-231	5.02E-10	
						Pb-211	1.63E-10	
			Pm-147	8.75E-02		Pm-147	6.98E-05	
						Po-211	4.98E-13	
						Po-215	1.63E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.65E-10	
			Rh-106	1.50E-02		Rh-106	9.61E-11	
						Rn-219	1.63E-10	
			Ru-106	1.12E-02		Ru-106	9.71E-11	
			Sb-125	6.24E-02		Sb-125	7.29E-05	
						Sm-147	2.14E-12	
			Sr-90	1.40E+00		Sr-90	7.37E-01	
			Te-125m	2.59E-02		Te-125m	1.77E-05	
						Th-227	1.61E-10	
						Th-231	8.69E-07	
						Tl-207	1.62E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.40E+00		Y-90	7.28E-01	
219	S832830	1983			2009	Ac-227	1.55E-10	1,000,000
			Ba-137m	4.79E+00		Ba-137m	2.62E+00	
						Bi-211	1.53E-10	
			Cs-137	5.11E+00		Cs-137	2.80E+00	
			Eu-155	9.55E-02		Eu-155	2.52E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	2.92E-01		Pm-147	3.06E-04	
						Po-211	4.66E-13	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	5.00E-02		Rh-106	6.37E-10	
						Rn-219	1.53E-10	
			Ru-106	3.74E-02		Ru-106	6.44E-10	
			Sb-125	2.08E-01		Sb-125	3.10E-04	
						Sm-147	7.15E-12	
			Sr-90	4.67E+00		Sr-90	2.51E+00	
			Te-125m	8.63E-02		Te-125m	7.52E-05	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E+00		Y-90	2.49E+00	
219	S832831	1983			2009	Ac-227	1.55E-10	30,000
			Ba-137m	1.92E-01		Ba-137m	1.05E-01	
						Bi-211	1.53E-10	
			Cs-137	2.04E-01		Cs-137	1.12E-01	
			Eu-155	3.82E-03		Eu-155	1.01E-04	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	1.17E-02		Pm-147	1.22E-05	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	2.00E-03		Rh-106	2.55E-11	
						Rn-219	1.53E-10	
			Ru-106	1.50E-03		Ru-106	2.58E-11	
			Sb-125	8.32E-03		Sb-125	1.24E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Sm-147	2.86E-13	
			Sr-90	1.87E-01		Sr-90	1.01E-01	
			Te-125m	3.45E-03		Te-125m	3.01E-06	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.87E-01		Y-90	9.94E-02	
219	S832832	1983			2009	Ac-227	9.13E-08	1000000+
			Ba-137m	3.59E+01		Ba-137m	1.96E+01	
						Bi-211	9.01E-08	
			Cs-137	3.83E+01		Cs-137	2.10E+01	
			Eu-155	7.17E-01		Eu-155	1.89E-02	
						Fr-223	1.25E-09	
						Pa-231	2.85E-07	
						Pb-211	9.02E-08	
			Pm-147	2.19E+00		Pm-147	2.27E-03	
						Po-211	2.75E-10	
						Po-215	9.02E-08	
			Pu-239	2.51E+00		Pu-239	2.51E+00	
						Ra-223	9.12E-08	
			Rh-106	3.75E-01		Rh-106	4.78E-09	
						Rn-219	9.01E-08	
			Ru-106	2.81E-01		Ru-106	4.83E-09	
			Sb-125	1.56E+00		Sb-125	2.33E-03	
						Sm-147	5.36E-11	
			Sr-90	3.50E+01		Sr-90	1.89E+01	
			Te-125m	6.48E-01		Te-125m	5.64E-04	
						Th-227	8.88E-08	
						Th-231	5.13E-04	
						Tl-207	8.97E-08	
			U-235	5.19E-04		U-235	5.19E-04	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Y-90	3.50E+01		Y-90	1.86E+01	
219	S832833	1983			2009	Ac-227	1.55E-10	200,000
			Ba-137m	7.19E+00		Ba-137m	3.93E+00	
						Bi-211	1.53E-10	
			Cs-137	7.66E+00		Cs-137	4.20E+00	
			Eu-155	1.43E-01		Eu-155	3.78E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	4.38E-01		Pm-147	4.55E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	7.49E-02		Rh-106	9.56E-10	
						Rn-219	1.53E-10	
			Ru-106	5.62E-02		Ru-106	9.66E-10	
			Sb-125	3.12E-01		Sb-125	4.66E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.77E+00	
			Te-125m	1.30E-01		Te-125m	1.13E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E+00		Y-90	3.73E+00	
219	S832834	1983			2009	Ac-227	1.55E-10	1000000+
			Ba-137m	1.20E+01		Ba-137m	6.55E+00	
						Bi-211	1.53E-10	
			Cs-137	1.28E+01		Cs-137	7.00E+00	
			Eu-155	2.39E-01		Eu-155	6.31E-03	
						Fr-223	2.11E-12	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	7.29E-01		Pm-147	7.53E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	1.25E-01		Rh-106	1.59E-09	
						Rn-219	1.53E-10	
			Ru-106	9.36E-02		Ru-106	1.61E-09	
			Sb-125	5.20E-01		Sb-125	7.76E-04	
						Sm-147	1.79E-11	
			Sr-90	1.17E+01		Sr-90	6.29E+00	
			Te-125m	2.16E-01		Te-125m	1.88E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.17E+01		Y-90	6.21E+00	
219	S832835	1983			2009	Ac-227	7.80E-09	1000000+
			Ba-137m	2.40E+01		Ba-137m	1.31E+01	
						Bi-211	7.70E-09	
			Cs-137	2.55E+01		Cs-137	1.40E+01	
			Eu-155	4.78E-01		Eu-155	1.26E-02	
						Fr-223	1.06E-10	
						Pa-231	2.44E-08	
						Pb-211	7.71E-09	
			Pm-147	1.46E+00		Pm-147	1.52E-03	
						Po-211	2.35E-11	
						Po-215	7.71E-09	
			Pu-239	3.09E-01		Pu-239	3.09E-01	
						Ra-223	7.80E-09	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Rh-106	2.50E-01		Rh-106	3.19E-09	
						Rn-219	7.70E-09	
			Ru-106	1.87E-01		Ru-106	3.22E-09	
			Sb-125	1.04E+00		Sb-125	1.55E-03	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.26E+01	
			Te-125m	4.32E-01		Te-125m	3.76E-04	
						Th-227	7.59E-09	
						Th-231	4.39E-05	
						Tl-207	7.67E-09	
			U-235	4.44E-05		U-235	4.44E-05	
			Y-90	2.33E+01		Y-90	1.24E+01	
220	S832836	1983			2009	Ac-227	1.55E-10	1000000+
			Ba-137m	2.40E+01		Ba-137m	1.31E+01	
						Bi-211	1.53E-10	
			Cs-137	2.55E+01		Cs-137	1.40E+01	
			Eu-155	4.78E-01		Eu-155	1.26E-02	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	1.46E+00		Pm-147	1.52E-03	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	2.50E-01		Rh-106	3.19E-09	
						Rn-219	1.53E-10	
			Ru-106	1.87E-01		Ru-106	3.22E-09	
			Sb-125	1.04E+00		Sb-125	1.55E-03	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.26E+01	
			Te-125m	4.32E-01		Te-125m	3.76E-04	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E+01		Y-90	1.24E+01	
220	S832837	1983			2009	Ac-227	1.55E-10	1000000+
			Ba-137m	2.40E+01		Ba-137m	1.31E+01	
						Bi-211	1.53E-10	
			Cs-137	2.55E+01		Cs-137	1.40E+01	
			Eu-155	4.78E-01		Eu-155	1.26E-02	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	1.46E+00		Pm-147	1.52E-03	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.82E-03		Pu-239	6.81E-03	
						Ra-223	1.55E-10	
			Rh-106	2.50E-01		Rh-106	3.19E-09	
						Rn-219	1.53E-10	
			Ru-106	1.87E-01		Ru-106	3.22E-09	
			Sb-125	1.04E+00		Sb-125	1.55E-03	
						Sm-147	3.57E-11	
			Sr-90	2.33E+01		Sr-90	1.26E+01	
			Te-125m	4.32E-01		Te-125m	3.76E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E+01		Y-90	1.24E+01	
220	S832838	1983			2009	Ac-227	1.55E-10	100,000
			Ba-137m	4.79E-01		Ba-137m	2.62E-01	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-211	1.53E-10	
			Cs-137	5.11E-01		Cs-137	2.80E-01	
			Eu-155	9.55E-03		Eu-155	2.52E-04	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	2.92E-02		Pm-147	3.02E-05	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	5.00E-03		Rh-106	6.37E-11	
						Rn-219	1.53E-10	
			Ru-106	3.74E-03		Ru-106	6.44E-11	
			Sb-125	2.08E-02		Sb-125	3.12E-05	
						Sm-147	7.15E-13	
			Sr-90	4.67E-01		Sr-90	2.51E-01	
			Te-125m	8.63E-03		Te-125m	7.55E-06	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.49E-01	
220	S832839	1983			2009	Ac-227	1.55E-10	200,000
			Ba-137m	1.92E+00		Ba-137m	1.05E+00	
						Bi-211	1.53E-10	
			Cs-137	2.04E+00		Cs-137	1.12E+00	
			Eu-155	3.82E-02		Eu-155	1.01E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	1.17E-01		Pm-147	1.21E-04	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	2.00E-02		Rh-106	2.55E-10	
						Rn-219	1.53E-10	
			Ru-106	1.50E-02		Ru-106	2.58E-10	
			Sb-125	8.32E-02		Sb-125	1.25E-04	
						Sm-147	2.86E-12	
			Sr-90	1.87E+00		Sr-90	1.01E+00	
			Te-125m	3.45E-02		Te-125m	3.02E-05	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.87E+00		Y-90	9.94E-01	
220	S832840	1983			2009	Ac-227	1.55E-10	1000000+
			Ba-137m	4.79E+01		Ba-137m	2.62E+01	
						Bi-211	1.53E-10	
			Cs-137	5.11E+01		Cs-137	2.80E+01	
			Eu-155	9.55E-01		Eu-155	2.52E-02	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	2.92E+00		Pm-147	3.01E-03	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	5.00E-01		Rh-106	6.37E-09	
						Rn-219	1.53E-10	
			Ru-106	3.74E-01		Ru-106	6.44E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sb-125	2.08E+00		Sb-125	3.10E-03	
						Sm-147	7.15E-11	
			Sr-90	4.67E+01		Sr-90	2.51E+01	
			Te-125m	8.63E-01		Te-125m	7.52E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E+01		Y-90	2.49E+01	
220	S832841	1983			2009	Ac-227	1.55E-10	1000000+
			Ba-137m	1.20E+01		Ba-137m	6.55E+00	
						Bi-211	1.53E-10	
			Cs-137	1.28E+01		Cs-137	7.00E+00	
			Eu-155	2.39E-01		Eu-155	6.31E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	7.29E-01		Pm-147	7.53E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	1.25E-01		Rh-106	1.59E-09	
						Rn-219	1.53E-10	
			Ru-106	9.36E-02		Ru-106	1.61E-09	
			Sb-125	5.20E-01		Sb-125	7.76E-04	
						Sm-147	1.79E-11	
			Sr-90	1.17E+01		Sr-90	6.29E+00	
			Te-125m	2.16E-01		Te-125m	1.88E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.17E+01		Y-90	6.21E+00	
221	S832842	1983			2009	Ac-227	1.55E-10	400,000
			Ba-137m	3.59E+00		Ba-137m	1.96E+00	
						Bi-211	1.53E-10	
			Cs-137	3.83E+00		Cs-137	2.10E+00	
			Eu-155	7.17E-02		Eu-155	1.89E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	2.19E-01		Pm-147	2.27E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	3.75E-02		Rh-106	4.78E-10	
						Rn-219	1.53E-10	
			Ru-106	2.81E-02		Ru-106	4.83E-10	
			Sb-125	1.56E-01		Sb-125	2.33E-04	
						Sm-147	5.36E-12	
			Sr-90	3.50E+00		Sr-90	1.89E+00	
			Te-125m	6.48E-02		Te-125m	5.65E-05	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E+00		Y-90	1.86E+00	
221	S832843	1983			2009	Ac-227	1.55E-10	1000000+
			Ba-137m	7.19E+00		Ba-137m	3.93E+00	
						Bi-211	1.53E-10	
			Cs-137	7.66E+00		Cs-137	4.20E+00	
			Eu-155	1.43E-01		Eu-155	3.78E-03	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	4.38E-01		Pm-147	4.55E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	7.49E-02		Rh-106	9.56E-10	
						Rn-219	1.53E-10	
			Ru-106	5.62E-02		Ru-106	9.66E-10	
			Sb-125	3.12E-01		Sb-125	4.66E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.77E+00	
			Te-125m	1.30E-01		Te-125m	1.13E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E+00		Y-90	3.73E+00	
221	S832844	1983			2009	Ac-227	1.55E-10	800,000
			Ba-137m	9.59E+00		Ba-137m	5.24E+00	
						Bi-211	1.53E-10	
			Cs-137	1.02E+01		Cs-137	5.60E+00	
			Eu-155	1.91E-01		Eu-155	5.05E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	5.83E-01		Pm-147	6.11E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	1.55E-10	
			Rh-106	9.99E-02		Rh-106	1.27E-09	
						Rn-219	1.53E-10	
			Ru-106	7.49E-02		Ru-106	1.29E-09	
			Sb-125	4.16E-01		Sb-125	6.21E-04	
						Sm-147	1.43E-11	
			Sr-90	9.34E+00		Sr-90	5.03E+00	
			Te-125m	1.73E-01		Te-125m	1.50E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E+00		Y-90	4.97E+00	
221	S832845	1983			2009	Ac-227	1.55E-10	60,000
			Ba-137m	3.59E-01		Ba-137m	1.96E-01	
						Bi-211	1.53E-10	
			Cs-137	3.83E-01		Cs-137	2.10E-01	
			Eu-155	7.17E-03		Eu-155	1.89E-04	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	2.19E-02		Pm-147	2.27E-05	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	3.75E-03		Rh-106	4.78E-11	
						Rn-219	1.53E-10	
			Ru-106	2.81E-03		Ru-106	4.83E-11	
			Sb-125	1.56E-02		Sb-125	2.34E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.89E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	6.48E-03		Te-125m	5.66E-06	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.86E-01	
221	S832846	1983			2009	Ac-227	1.55E-10	200,000
			Ba-137m	1.44E+01		Ba-137m	7.85E+00	
						Bi-211	1.53E-10	
			Cs-137	1.53E+01		Cs-137	8.40E+00	
			Eu-155	2.87E-01		Eu-155	7.57E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	8.75E-01		Pm-147	9.15E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	1.50E-01		Rh-106	1.91E-09	
						Rn-219	1.53E-10	
			Ru-106	1.12E-01		Ru-106	1.93E-09	
			Sb-125	6.24E-01		Sb-125	9.33E-04	
						Sm-147	2.14E-11	
			Sr-90	1.40E+01		Sr-90	7.54E+00	
			Te-125m	2.59E-01		Te-125m	2.26E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.40E+01		Y-90	7.46E+00	
221	S832847	1983			2009	Ac-227	1.55E-10	200,000

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	7.19E+00		Ba-137m	3.93E+00	
						Bi-211	1.53E-10	
			Cs-137	7.66E+00		Cs-137	4.20E+00	
			Eu-155	1.43E-01		Eu-155	3.78E-03	
						Fr-223	2.11E-12	
						Pa-231	4.83E-10	
						Pb-211	1.53E-10	
			Pm-147	4.38E-01		Pm-147	4.55E-04	
						Po-211	4.66E-13	
						Po-215	1.53E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.55E-10	
			Rh-106	7.49E-02		Rh-106	9.56E-10	
						Rn-219	1.53E-10	
			Ru-106	5.62E-02		Ru-106	9.66E-10	
			Sb-125	3.12E-01		Sb-125	4.66E-04	
						Sm-147	1.07E-11	
			Sr-90	7.00E+00		Sr-90	3.77E+00	
			Te-125m	1.30E-01		Te-125m	1.13E-04	
						Th-227	1.51E-10	
						Th-231	8.69E-07	
						Tl-207	1.52E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E+00		Y-90	3.73E+00	
222	S830716	1983			2009	Ac-227	8.70E-10	900,000
			Ba-137m	4.79E+00		Ba-137m	2.62E+00	
						Bi-211	8.59E-10	
			Cs-137	5.11E+00		Cs-137	2.80E+00	
			Eu-155	9.55E-02		Eu-155	2.52E-03	
						Fr-223	1.19E-11	
						Pa-231	2.72E-09	
						Pb-211	8.60E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	2.92E-01		Pm-147	3.06E-04	
						Po-211	2.62E-12	
						Po-215	8.60E-10	
			Pu-239	3.50E-02		Pu-239	3.49E-02	
						Ra-223	8.69E-10	
			Rh-106	5.00E-02		Rh-106	6.37E-10	
						Rn-219	8.59E-10	
			Ru-106	3.74E-02		Ru-106	6.44E-10	
			Sb-125	2.08E-01		Sb-125	3.10E-04	
						Sm-147	7.15E-12	
			Sr-90	4.67E+00		Sr-90	2.51E+00	
			Te-125m	8.63E-02		Te-125m	7.52E-05	
						Th-227	8.47E-10	
						Th-231	4.89E-06	
						Tl-207	8.55E-10	
			U-235	4.95E-06		U-235	4.95E-06	
			Y-90	4.66E+00		Y-90	2.49E+00	
222	S830717	1983			2009	Ac-227	8.70E-10	1000000+
			Ba-137m	4.79E+01		Ba-137m	2.62E+01	
						Bi-211	8.59E-10	
			Cs-137	5.11E+01		Cs-137	2.80E+01	
			Eu-155	9.55E-01		Eu-155	2.52E-02	
						Fr-223	1.19E-11	
						Pa-231	2.72E-09	
						Pb-211	8.60E-10	
			Pm-147	2.92E+00		Pm-147	3.01E-03	
						Po-211	2.62E-12	
						Po-215	8.60E-10	
			Pu-239	3.50E-02		Pu-239	3.49E-02	
						Ra-223	8.69E-10	
			Rh-106	5.00E-01		Rh-106	6.37E-09	
						Rn-219	8.59E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	3.74E-01		Ru-106	6.44E-09	
			Sb-125	2.08E+00		Sb-125	3.10E-03	
						Sm-147	7.15E-11	
			Sr-90	4.67E+01		Sr-90	2.51E+01	
			Te-125m	8.63E-01		Te-125m	7.52E-04	
						Th-227	8.47E-10	
						Th-231	4.89E-06	
						Tl-207	8.55E-10	
			U-235	4.95E-06		U-235	4.95E-06	
			Y-90	4.66E+01		Y-90	2.49E+01	
222	S830781	1983			2009	Ac-225	5.81E-17	20,000
						Ac-227	4.83E-11	
						Ac-228	1.96E-17	
						Am-241	4.25E-04	
						At-217	5.82E-17	
			Ba-137m	2.40E-01		Ba-137m	1.31E-01	
						Bi-210	2.26E-12	
						Bi-211	4.77E-11	
						Bi-212	1.97E-17	
						Bi-213	5.80E-17	
						Bi-214	1.01E-11	
			Cs-137	2.55E-01		Cs-137	1.40E-01	
			Eu-155	4.78E-03		Eu-155	1.26E-04	
						Fr-221	5.81E-17	
						Fr-223	6.59E-13	
						Np-237	2.18E-09	
						Pa-231	1.51E-10	
						Pa-233	2.16E-09	
						Pa-234	3.21E-11	
						Pa-234m	2.47E-08	
						Pb-209	5.81E-17	
						Pb-210	2.29E-12	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pb-211	4.77E-11	
						Pb-212	1.97E-17	
						Pb-214	1.02E-11	
			Pm-147	1.46E-02		Pm-147	1.51E-05	
						Po-210	2.28E-12	
						Po-211	1.45E-13	
						Po-212	1.26E-17	
						Po-213	5.68E-17	
						Po-214	1.02E-11	
						Po-215	4.77E-11	
						Po-216	1.96E-17	
						Po-218	9.98E-12	
			Pu-238	2.55E-04		Pu-238	2.08E-04	
			Pu-239	2.82E-03		Pu-239	2.82E-03	
			Pu-240	9.72E-04		Pu-240	9.69E-04	
			Pu-241	1.83E-02		Pu-241	5.23E-03	
			Pu-242	1.38E-07		Pu-242	1.38E-07	
						Ra-223	4.83E-11	
						Ra-224	1.96E-17	
						Ra-225	5.81E-17	
						Ra-226	1.03E-11	
						Ra-228	2.32E-17	
			Rh-106	2.50E-03		Rh-106	3.19E-11	
						Rn-219	4.77E-11	
						Rn-220	1.96E-17	
						Rn-222	1.02E-11	
			Ru-106	1.87E-03		Ru-106	3.22E-11	
			Sb-125	1.04E-02		Sb-125	1.54E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.26E-01	
			Te-125m	4.32E-03		Te-125m	3.76E-06	
						Th-227	4.70E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-228	1.99E-17	
						Th-229	5.82E-17	
						Th-230	1.83E-09	
						Th-231	2.71E-07	
						Th-232	3.05E-17	
						Th-234	2.48E-08	
						Tl-207	4.75E-11	
						Tl-208	7.07E-18	
						Tl-209	1.28E-18	
						U-233	9.02E-14	
			U-234	7.81E-06		U-234	7.83E-06	
			U-235	2.75E-07		U-235	2.75E-07	
			U-236	2.34E-08		U-236	2.41E-08	
						U-237	1.29E-07	
			U-238	2.50E-08		U-238	2.50E-08	
			Y-90	2.33E-01		Y-90	1.24E-01	
222	S830787	1983			2009	Ac-225	1.39E-16	200,000
						Ac-227	1.21E-10	
						Ac-228	4.91E-17	
						Am-241	1.02E-03	
						At-217	1.40E-16	
			Ba-137m	9.59E+00		Ba-137m	5.24E+00	
						Bi-210	5.65E-12	
						Bi-211	1.19E-10	
						Bi-212	4.93E-17	
						Bi-213	1.39E-16	
						Bi-214	2.53E-11	
			Cs-137	1.02E+01		Cs-137	5.60E+00	
			Eu-155	1.91E-01		Eu-155	5.05E-03	
						Fr-221	1.39E-16	
						Fr-223	1.65E-12	
						Np-237	5.23E-09	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	3.77E-10	
						Pa-233	5.18E-09	
						Pa-234	8.04E-11	
						Pa-234m	6.18E-08	
						Pb-209	1.39E-16	
						Pb-210	5.71E-12	
						Pb-211	1.19E-10	
						Pb-212	4.91E-17	
						Pb-214	2.54E-11	
			Pm-147	5.83E-01		Pm-147	6.11E-04	
						Po-210	5.71E-12	
						Po-211	3.64E-13	
						Po-212	3.14E-17	
						Po-213	1.36E-16	
						Po-214	2.54E-11	
						Po-215	1.19E-10	
						Po-216	4.91E-17	
						Po-218	2.49E-11	
			Pu-238	6.12E-04		Pu-238	4.98E-04	
			Pu-239	6.78E-03		Pu-239	6.77E-03	
			Pu-240	2.33E-03		Pu-240	2.33E-03	
			Pu-241	4.39E-02		Pu-241	1.26E-02	
			Pu-242	3.32E-07		Pu-242	3.32E-07	
						Ra-223	1.21E-10	
						Ra-224	4.90E-17	
						Ra-225	1.40E-16	
						Ra-226	2.57E-11	
						Ra-228	5.79E-17	
			Rh-106	9.99E-02		Rh-106	1.27E-09	
						Rn-219	1.19E-10	
						Rn-220	4.91E-17	
						Rn-222	2.54E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	7.49E-02		Ru-106	1.29E-09	
			Sb-125	4.16E-01		Sb-125	6.21E-04	
						Sm-147	1.43E-11	
			Sr-90	9.34E+00		Sr-90	5.03E+00	
			Te-125m	1.73E-01		Te-125m	1.50E-04	
						Th-227	1.17E-10	
						Th-228	4.97E-17	
						Th-229	1.40E-16	
						Th-230	4.57E-09	
						Th-231	6.79E-07	
						Th-232	7.63E-17	
						Th-234	6.19E-08	
						Tl-207	1.19E-10	
						Tl-208	1.77E-17	
						Tl-209	3.07E-18	
						U-233	2.16E-13	
			U-234	1.95E-05		U-234	1.96E-05	
			U-235	6.87E-07		U-235	6.87E-07	
			U-236	5.85E-08		U-236	6.03E-08	
						U-237	3.09E-07	
			U-238	6.25E-08		U-238	6.25E-08	
			Y-90	9.33E+00		Y-90	4.97E+00	
222	S830788	1983			2009	Ac-225	1.39E-16	100,000
						Ac-227	1.21E-10	
						Ac-228	4.91E-17	
						Am-241	1.02E-03	
						At-217	1.40E-16	
			Ba-137m	9.59E+00		Ba-137m	5.24E+00	
						Bi-210	5.65E-12	
						Bi-211	1.19E-10	
						Bi-212	4.93E-17	
						Bi-213	1.39E-16	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-214	2.53E-11	
			Cs-137	1.02E+01		Cs-137	5.60E+00	
			Eu-155	1.91E-01		Eu-155	5.05E-03	
						Fr-221	1.39E-16	
						Fr-223	1.65E-12	
						Np-237	5.23E-09	
						Pa-231	3.77E-10	
						Pa-233	5.18E-09	
						Pa-234	8.04E-11	
						Pa-234m	6.18E-08	
						Pb-209	1.39E-16	
						Pb-210	5.71E-12	
						Pb-211	1.19E-10	
						Pb-212	4.91E-17	
						Pb-214	2.54E-11	
			Pm-147	5.83E-01		Pm-147	6.11E-04	
						Po-210	5.71E-12	
						Po-211	3.64E-13	
						Po-212	3.14E-17	
						Po-213	1.36E-16	
						Po-214	2.54E-11	
						Po-215	1.19E-10	
						Po-216	4.91E-17	
						Po-218	2.49E-11	
			Pu-238	6.12E-04		Pu-238	4.98E-04	
			Pu-239	6.78E-03		Pu-239	6.77E-03	
			Pu-240	2.33E-03		Pu-240	2.33E-03	
			Pu-241	4.39E-02		Pu-241	1.26E-02	
			Pu-242	3.32E-07		Pu-242	3.32E-07	
						Ra-223	1.21E-10	
						Ra-224	4.90E-17	
						Ra-225	1.40E-16	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-226	2.57E-11	
						Ra-228	5.79E-17	
			Rh-106	9.99E-02		Rh-106	1.27E-09	
						Rn-219	1.19E-10	
						Rn-220	4.91E-17	
						Rn-222	2.54E-11	
			Ru-106	7.49E-02		Ru-106	1.29E-09	
			Sb-125	4.16E-01		Sb-125	6.21E-04	
						Sm-147	1.43E-11	
			Sr-90	9.34E+00		Sr-90	5.03E+00	
			Te-125m	1.73E-01		Te-125m	1.50E-04	
						Th-227	1.17E-10	
						Th-228	4.97E-17	
						Th-229	1.40E-16	
						Th-230	4.57E-09	
						Th-231	6.79E-07	
						Th-232	7.63E-17	
						Th-234	6.19E-08	
						Tl-207	1.19E-10	
						Tl-208	1.77E-17	
						Tl-209	3.07E-18	
						U-233	2.16E-13	
			U-234	1.95E-05		U-234	1.96E-05	
			U-235	6.87E-07		U-235	6.87E-07	
			U-236	5.85E-08		U-236	6.03E-08	
						U-237	3.09E-07	
			U-238	6.25E-08		U-238	6.25E-08	
			Y-90	9.33E+00		Y-90	4.97E+00	
222	S830789	1983			2009	Ac-225	1.16E-16	10,000
						Ac-227	9.66E-11	
						Ac-228	3.93E-17	
						Am-241	8.50E-04	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						At-217	1.16E-16	
			Ba-137m	4.79E-02		Ba-137m	2.62E-02	
						Bi-210	4.52E-12	
						Bi-211	9.53E-11	
						Bi-212	3.94E-17	
						Bi-213	1.16E-16	
						Bi-214	2.03E-11	
			Cs-137	5.11E-02		Cs-137	2.80E-02	
			Eu-155	9.55E-04		Eu-155	2.52E-05	
						Fr-221	1.16E-16	
						Fr-223	1.32E-12	
						Np-237	4.36E-09	
						Pa-231	3.02E-10	
						Pa-233	4.32E-09	
						Pa-234	6.43E-11	
						Pa-234m	4.94E-08	
						Pb-209	1.16E-16	
						Pb-210	4.57E-12	
						Pb-211	9.55E-11	
						Pb-212	3.93E-17	
						Pb-214	2.03E-11	
			Pm-147	2.92E-03		Pm-147	3.05E-06	
						Po-210	4.57E-12	
						Po-211	2.91E-13	
						Po-212	2.51E-17	
						Po-213	1.14E-16	
						Po-214	2.03E-11	
						Po-215	9.55E-11	
						Po-216	3.93E-17	
						Po-218	2.00E-11	
			Pu-238	5.10E-04		Pu-238	4.15E-04	
			Pu-239	5.65E-03		Pu-239	5.64E-03	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pu-240	1.94E-03		Pu-240	1.94E-03	
			Pu-241	3.66E-02		Pu-241	1.05E-02	
			Pu-242	2.77E-07		Pu-242	2.77E-07	
						Ra-223	9.65E-11	
						Ra-224	3.92E-17	
						Ra-225	1.16E-16	
						Ra-226	2.05E-11	
						Ra-228	4.63E-17	
			Rh-106	5.00E-04		Rh-106	6.37E-12	
						Rn-219	9.53E-11	
						Rn-220	3.93E-17	
						Rn-222	2.03E-11	
			Ru-106	3.74E-04		Ru-106	6.44E-12	
			Sb-125	2.08E-03		Sb-125	3.11E-06	
						Sm-147	7.15E-14	
			Sr-90	4.67E-02		Sr-90	2.51E-02	
			Te-125m	8.63E-04		Te-125m	7.52E-07	
						Th-227	9.40E-11	
						Th-228	3.97E-17	
						Th-229	1.16E-16	
						Th-230	3.66E-09	
						Th-231	5.43E-07	
						Th-232	6.11E-17	
						Th-234	4.95E-08	
						Tl-207	9.49E-11	
						Tl-208	1.41E-17	
						Tl-209	2.56E-18	
						U-233	1.80E-13	
			U-234	1.56E-05		U-234	1.57E-05	
			U-235	5.49E-07		U-235	5.50E-07	
			U-236	4.68E-08		U-236	4.83E-08	
						U-237	2.57E-07	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-238	5.00E-08		U-238	5.00E-08	
			Y-90	4.66E-02		Y-90	2.49E-02	
222	S830790	1983			2009	Ac-225	3.38E-15	200,000
						Ac-227	2.81E-09	
						Ac-228	1.14E-15	
						Am-241	2.47E-02	
						At-217	3.38E-15	
			Ba-137m	9.59E+00		Ba-137m	5.24E+00	
						Bi-210	1.31E-10	
						Bi-211	2.77E-09	
						Bi-212	1.15E-15	
						Bi-213	3.38E-15	
						Bi-214	5.90E-10	
			Cs-137	1.02E+01		Cs-137	5.60E+00	
			Eu-155	1.91E-01		Eu-155	5.05E-03	
						Fr-221	3.38E-15	
						Fr-223	3.83E-11	
						Np-237	1.27E-07	
						Pa-231	8.79E-09	
						Pa-233	1.26E-07	
						Pa-234	1.87E-09	
						Pa-234m	1.44E-06	
						Pb-209	3.38E-15	
						Pb-210	1.33E-10	
						Pb-211	2.78E-09	
						Pb-212	1.14E-15	
						Pb-214	5.91E-10	
			Pm-147	5.83E-01		Pm-147	6.11E-04	
						Po-210	1.33E-10	
						Po-211	8.47E-12	
						Po-212	7.31E-16	
						Po-213	3.31E-15	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-214	5.91E-10	
						Po-215	2.78E-09	
						Po-216	1.14E-15	
						Po-218	5.81E-10	
			Pu-238	1.48E-02		Pu-238	1.21E-02	
			Pu-239	1.64E-01		Pu-239	1.64E-01	
			Pu-240	5.66E-02		Pu-240	5.64E-02	
			Pu-241	1.07E+00		Pu-241	3.05E-01	
			Pu-242	8.06E-06		Pu-242	8.06E-06	
						Ra-223	2.81E-09	
						Ra-224	1.14E-15	
						Ra-225	3.38E-15	
						Ra-226	5.97E-10	
						Ra-228	1.35E-15	
			Rh-106	9.99E-02		Rh-106	1.27E-09	
						Rn-219	2.77E-09	
						Rn-220	1.14E-15	
						Rn-222	5.91E-10	
			Ru-106	7.49E-02		Ru-106	1.29E-09	
			Sb-125	4.16E-01		Sb-125	6.21E-04	
						Sm-147	1.43E-11	
			Sr-90	9.34E+00		Sr-90	5.03E+00	
			Te-125m	1.73E-01		Te-125m	1.50E-04	
						Th-227	2.73E-09	
						Th-228	1.16E-15	
						Th-229	3.39E-15	
						Th-230	1.06E-07	
						Th-231	1.58E-05	
						Th-232	1.78E-15	
						Th-234	1.44E-06	
						Tl-207	2.76E-09	
						Tl-208	4.12E-16	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Tl-209	7.43E-17	
						U-233	5.25E-12	
			U-234	4.55E-04		U-234	4.56E-04	
			U-235	1.60E-05		U-235	1.60E-05	
			U-236	1.36E-06		U-236	1.41E-06	
						U-237	7.48E-06	
			U-238	1.45E-06		U-238	1.45E-06	
			Y-90	9.33E+00		Y-90	4.97E+00	
223	S830782	1983			2009	Ac-225	5.81E-17	100,000
						Ac-227	4.83E-11	
						Ac-228	1.96E-17	
						Am-241	4.25E-04	
						At-217	5.82E-17	
			Ba-137m	5.99E+00		Ba-137m	3.27E+00	
						Bi-210	2.26E-12	
						Bi-211	4.77E-11	
						Bi-212	1.97E-17	
						Bi-213	5.80E-17	
						Bi-214	1.01E-11	
			Cs-137	6.38E+00		Cs-137	3.50E+00	
			Eu-155	1.19E-01		Eu-155	3.15E-03	
						Fr-221	5.81E-17	
						Fr-223	6.59E-13	
						Np-237	2.18E-09	
						Pa-231	1.51E-10	
						Pa-233	2.16E-09	
						Pa-234	3.21E-11	
						Pa-234m	2.47E-08	
						Pb-209	5.81E-17	
						Pb-210	2.29E-12	
						Pb-211	4.77E-11	
						Pb-212	1.97E-17	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pb-214	1.02E-11	
			Pm-147	3.65E-01		Pm-147	3.77E-04	
						Po-210	2.28E-12	
						Po-211	1.45E-13	
						Po-212	1.26E-17	
						Po-213	5.68E-17	
						Po-214	1.02E-11	
						Po-215	4.77E-11	
						Po-216	1.96E-17	
						Po-218	9.98E-12	
			Pu-238	2.55E-04		Pu-238	2.08E-04	
			Pu-239	2.82E-03		Pu-239	2.82E-03	
			Pu-240	9.72E-04		Pu-240	9.69E-04	
			Pu-241	1.83E-02		Pu-241	5.23E-03	
			Pu-242	1.38E-07		Pu-242	1.38E-07	
						Ra-223	4.83E-11	
						Ra-224	1.96E-17	
						Ra-225	5.81E-17	
						Ra-226	1.03E-11	
						Ra-228	2.32E-17	
			Rh-106	6.24E-02		Rh-106	7.97E-10	
						Rn-219	4.77E-11	
						Rn-220	1.96E-17	
						Rn-222	1.02E-11	
			Ru-106	4.68E-02		Ru-106	8.05E-10	
			Sb-125	2.60E-01		Sb-125	3.88E-04	
						Sm-147	8.93E-12	
			Sr-90	5.84E+00		Sr-90	3.14E+00	
			Te-125m	1.08E-01		Te-125m	9.40E-05	
						Th-227	4.70E-11	
						Th-228	1.99E-17	
						Th-229	5.82E-17	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-230	1.83E-09	
						Th-231	2.71E-07	
						Th-232	3.05E-17	
						Th-234	2.48E-08	
						Tl-207	4.75E-11	
						Tl-208	7.07E-18	
						Tl-209	1.28E-18	
						U-233	9.02E-14	
			U-234	7.81E-06		U-234	7.83E-06	
			U-235	2.75E-07		U-235	2.75E-07	
			U-236	2.34E-08		U-236	2.41E-08	
						U-237	1.29E-07	
			U-238	2.50E-08		U-238	2.50E-08	
			Y-90	5.83E+00		Y-90	3.11E+00	
223	S830783	1983			2009	Ac-225	1.16E-16	25,000
						Ac-227	9.66E-11	
						Ac-228	3.93E-17	
						Am-241	8.50E-04	
						At-217	1.16E-16	
			Ba-137m	7.19E-01		Ba-137m	3.93E-01	
						Bi-210	4.52E-12	
						Bi-211	9.53E-11	
						Bi-212	3.94E-17	
						Bi-213	1.16E-16	
						Bi-214	2.03E-11	
			Cs-137	7.66E-01		Cs-137	4.20E-01	
			Eu-155	1.43E-02		Eu-155	3.78E-04	
						Fr-221	1.16E-16	
						Fr-223	1.32E-12	
						Np-237	4.36E-09	
						Pa-231	3.02E-10	
						Pa-233	4.32E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-234	6.43E-11	
						Pa-234m	4.94E-08	
						Pb-209	1.16E-16	
						Pb-210	4.57E-12	
						Pb-211	9.55E-11	
						Pb-212	3.93E-17	
						Pb-214	2.03E-11	
			Pm-147	4.38E-02		Pm-147	4.54E-05	
						Po-210	4.57E-12	
						Po-211	2.91E-13	
						Po-212	2.51E-17	
						Po-213	1.14E-16	
						Po-214	2.03E-11	
						Po-215	9.55E-11	
						Po-216	3.93E-17	
						Po-218	2.00E-11	
			Pu-238	5.10E-04		Pu-238	4.15E-04	
			Pu-239	5.65E-03		Pu-239	5.64E-03	
			Pu-240	1.94E-03		Pu-240	1.94E-03	
			Pu-241	3.66E-02		Pu-241	1.05E-02	
			Pu-242	2.77E-07		Pu-242	2.77E-07	
						Ra-223	9.65E-11	
						Ra-224	3.92E-17	
						Ra-225	1.16E-16	
						Ra-226	2.05E-11	
						Ra-228	4.63E-17	
			Rh-106	7.49E-03		Rh-106	9.56E-11	
						Rn-219	9.53E-11	
						Rn-220	3.93E-17	
						Rn-222	2.03E-11	
			Ru-106	5.62E-03		Ru-106	9.66E-11	
			Sb-125	3.12E-02		Sb-125	4.67E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.77E-01	
			Te-125m	1.30E-02		Te-125m	1.13E-05	
						Th-227	9.40E-11	
						Th-228	3.97E-17	
						Th-229	1.16E-16	
						Th-230	3.66E-09	
						Th-231	5.43E-07	
						Th-232	6.11E-17	
						Th-234	4.95E-08	
						Tl-207	9.49E-11	
						Tl-208	1.41E-17	
						Tl-209	2.56E-18	
						U-233	1.80E-13	
			U-234	1.56E-05		U-234	1.57E-05	
			U-235	5.49E-07		U-235	5.50E-07	
			U-236	4.68E-08		U-236	4.83E-08	
						U-237	2.57E-07	
			U-238	5.00E-08		U-238	5.00E-08	
			Y-90	6.99E-01		Y-90	3.73E-01	
223	S830784	1983			2009	Ac-225	1.16E-16	30,000
						Ac-227	9.66E-11	
						Ac-228	3.93E-17	
						Am-241	8.50E-04	
						At-217	1.16E-16	
			Ba-137m	7.19E-01		Ba-137m	3.93E-01	
						Bi-210	4.52E-12	
						Bi-211	9.53E-11	
						Bi-212	3.94E-17	
						Bi-213	1.16E-16	
						Bi-214	2.03E-11	
			Cs-137	7.66E-01		Cs-137	4.20E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Eu-155	1.43E-02		Eu-155	3.78E-04	
						Fr-221	1.16E-16	
						Fr-223	1.32E-12	
						Np-237	4.36E-09	
						Pa-231	3.02E-10	
						Pa-233	4.32E-09	
						Pa-234	6.43E-11	
						Pa-234m	4.94E-08	
						Pb-209	1.16E-16	
						Pb-210	4.57E-12	
						Pb-211	9.55E-11	
						Pb-212	3.93E-17	
						Pb-214	2.03E-11	
			Pm-147	4.38E-02		Pm-147	4.54E-05	
						Po-210	4.57E-12	
						Po-211	2.91E-13	
						Po-212	2.51E-17	
						Po-213	1.14E-16	
						Po-214	2.03E-11	
						Po-215	9.55E-11	
						Po-216	3.93E-17	
						Po-218	2.00E-11	
			Pu-238	5.10E-04		Pu-238	4.15E-04	
			Pu-239	5.65E-03		Pu-239	5.64E-03	
			Pu-240	1.94E-03		Pu-240	1.94E-03	
			Pu-241	3.66E-02		Pu-241	1.05E-02	
			Pu-242	2.77E-07		Pu-242	2.77E-07	
						Ra-223	9.65E-11	
						Ra-224	3.92E-17	
						Ra-225	1.16E-16	
						Ra-226	2.05E-11	
						Ra-228	4.63E-17	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Rh-106	7.49E-03		Rh-106	9.56E-11	
						Rn-219	9.53E-11	
						Rn-220	3.93E-17	
						Rn-222	2.03E-11	
			Ru-106	5.62E-03		Ru-106	9.66E-11	
			Sb-125	3.12E-02		Sb-125	4.67E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.77E-01	
			Te-125m	1.30E-02		Te-125m	1.13E-05	
						Th-227	9.40E-11	
						Th-228	3.97E-17	
						Th-229	1.16E-16	
						Th-230	3.66E-09	
						Th-231	5.43E-07	
						Th-232	6.11E-17	
						Th-234	4.95E-08	
						Tl-207	9.49E-11	
						Tl-208	1.41E-17	
						Tl-209	2.56E-18	
						U-233	1.80E-13	
			U-234	1.56E-05		U-234	1.57E-05	
			U-235	5.49E-07		U-235	5.50E-07	
			U-236	4.68E-08		U-236	4.83E-08	
						U-237	2.57E-07	
			U-238	5.00E-08		U-238	5.00E-08	
			Y-90	6.99E-01		Y-90	3.73E-01	
223	S830785	1983			2009	Ac-225	1.16E-16	70,000
						Ac-227	9.66E-11	
						Ac-228	3.93E-17	
						Am-241	8.50E-04	
						At-217	1.16E-16	
			Ba-137m	7.19E-01		Ba-137m	3.93E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-210	4.52E-12	
						Bi-211	9.53E-11	
						Bi-212	3.94E-17	
						Bi-213	1.16E-16	
						Bi-214	2.03E-11	
			Cs-137	7.66E-01		Cs-137	4.20E-01	
			Eu-155	1.43E-02		Eu-155	3.78E-04	
						Fr-221	1.16E-16	
						Fr-223	1.32E-12	
						Np-237	4.36E-09	
						Pa-231	3.02E-10	
						Pa-233	4.32E-09	
						Pa-234	6.43E-11	
						Pa-234m	4.94E-08	
						Pb-209	1.16E-16	
						Pb-210	4.57E-12	
						Pb-211	9.55E-11	
						Pb-212	3.93E-17	
						Pb-214	2.03E-11	
			Pm-147	4.38E-02		Pm-147	4.54E-05	
						Po-210	4.57E-12	
						Po-211	2.91E-13	
						Po-212	2.51E-17	
						Po-213	1.14E-16	
						Po-214	2.03E-11	
						Po-215	9.55E-11	
						Po-216	3.93E-17	
						Po-218	2.00E-11	
			Pu-238	5.10E-04		Pu-238	4.15E-04	
			Pu-239	5.65E-03		Pu-239	5.64E-03	
			Pu-240	1.94E-03		Pu-240	1.94E-03	
			Pu-241	3.66E-02		Pu-241	1.05E-02	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pu-242	2.77E-07		Pu-242	2.77E-07	
						Ra-223	9.65E-11	
						Ra-224	3.92E-17	
						Ra-225	1.16E-16	
						Ra-226	2.05E-11	
						Ra-228	4.63E-17	
			Rh-106	7.49E-03		Rh-106	9.56E-11	
						Rn-219	9.53E-11	
						Rn-220	3.93E-17	
						Rn-222	2.03E-11	
			Ru-106	5.62E-03		Ru-106	9.66E-11	
			Sb-125	3.12E-02		Sb-125	4.67E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.77E-01	
			Te-125m	1.30E-02		Te-125m	1.13E-05	
						Th-227	9.40E-11	
						Th-228	3.97E-17	
						Th-229	1.16E-16	
						Th-230	3.66E-09	
						Th-231	5.43E-07	
						Th-232	6.11E-17	
						Th-234	4.95E-08	
						Tl-207	9.49E-11	
						Tl-208	1.41E-17	
						Tl-209	2.56E-18	
						U-233	1.80E-13	
			U-234	1.56E-05		U-234	1.57E-05	
			U-235	5.49E-07		U-235	5.50E-07	
			U-236	4.68E-08		U-236	4.83E-08	
						U-237	2.57E-07	
			U-238	5.00E-08		U-238	5.00E-08	
			Y-90	6.99E-01		Y-90	3.73E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
223	S830786	1983			2009	Ac-225	5.81E-17	20,000
						Ac-227	4.83E-11	
						Ac-228	1.96E-17	
						Am-241	4.25E-04	
						At-217	5.82E-17	
			Ba-137m	3.59E-01		Ba-137m	1.96E-01	
						Bi-210	2.26E-12	
						Bi-211	4.77E-11	
						Bi-212	1.97E-17	
						Bi-213	5.80E-17	
						Bi-214	1.01E-11	
			Cs-137	3.83E-01		Cs-137	2.10E-01	
			Eu-155	7.17E-03		Eu-155	1.89E-04	
						Fr-221	5.81E-17	
						Fr-223	6.59E-13	
						Np-237	2.18E-09	
						Pa-231	1.51E-10	
						Pa-233	2.16E-09	
						Pa-234	3.21E-11	
						Pa-234m	2.47E-08	
						Pb-209	5.81E-17	
						Pb-210	2.29E-12	
						Pb-211	4.77E-11	
						Pb-212	1.97E-17	
						Pb-214	1.02E-11	
			Pm-147	2.19E-02		Pm-147	2.27E-05	
						Po-210	2.28E-12	
						Po-211	1.45E-13	
						Po-212	1.26E-17	
						Po-213	5.68E-17	
						Po-214	1.02E-11	
						Po-215	4.77E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-216	1.96E-17	
						Po-218	9.98E-12	
			Pu-238	2.55E-04		Pu-238	2.08E-04	
			Pu-239	2.82E-03		Pu-239	2.82E-03	
			Pu-240	9.72E-04		Pu-240	9.69E-04	
			Pu-241	1.83E-02		Pu-241	5.23E-03	
			Pu-242	1.38E-07		Pu-242	1.38E-07	
						Ra-223	4.83E-11	
						Ra-224	1.96E-17	
						Ra-225	5.81E-17	
						Ra-226	1.03E-11	
						Ra-228	2.32E-17	
			Rh-106	3.75E-03		Rh-106	4.78E-11	
						Rn-219	4.77E-11	
						Rn-220	1.96E-17	
						Rn-222	1.02E-11	
			Ru-106	2.81E-03		Ru-106	4.83E-11	
			Sb-125	1.56E-02		Sb-125	2.34E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.89E-01	
			Te-125m	6.48E-03		Te-125m	5.66E-06	
						Th-227	4.70E-11	
						Th-228	1.99E-17	
						Th-229	5.82E-17	
						Th-230	1.83E-09	
						Th-231	2.71E-07	
						Th-232	3.05E-17	
						Th-234	2.48E-08	
						Tl-207	4.75E-11	
						Tl-208	7.07E-18	
						Tl-209	1.28E-18	
						U-233	9.02E-14	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-234	7.81E-06		U-234	7.83E-06	
			U-235	2.75E-07		U-235	2.75E-07	
			U-236	2.34E-08		U-236	2.41E-08	
						U-237	1.29E-07	
			U-238	2.50E-08		U-238	2.50E-08	
			Y-90	3.50E-01		Y-90	1.86E-01	
223	S830791	1983			2009	Ac-225	1.16E-16	32,000
						Ac-227	9.66E-11	
						Ac-228	3.93E-17	
						Am-241	8.50E-04	
						At-217	1.16E-16	
			Ba-137m	3.59E-01		Ba-137m	1.96E-01	
						Bi-210	4.52E-12	
						Bi-211	9.53E-11	
						Bi-212	3.94E-17	
						Bi-213	1.16E-16	
						Bi-214	2.03E-11	
			Cs-137	3.83E-01		Cs-137	2.10E-01	
			Eu-155	7.17E-03		Eu-155	1.89E-04	
						Fr-221	1.16E-16	
						Fr-223	1.32E-12	
						Np-237	4.36E-09	
						Pa-231	3.02E-10	
						Pa-233	4.32E-09	
						Pa-234	6.43E-11	
						Pa-234m	4.94E-08	
						Pb-209	1.16E-16	
						Pb-210	4.57E-12	
						Pb-211	9.55E-11	
						Pb-212	3.93E-17	
						Pb-214	2.03E-11	
			Pm-147	2.19E-02		Pm-147	2.27E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-210	4.57E-12	
						Po-211	2.91E-13	
						Po-212	2.51E-17	
						Po-213	1.14E-16	
						Po-214	2.03E-11	
						Po-215	9.55E-11	
						Po-216	3.93E-17	
						Po-218	2.00E-11	
			Pu-238	5.10E-04		Pu-238	4.15E-04	
			Pu-239	5.65E-03		Pu-239	5.64E-03	
			Pu-240	1.94E-03		Pu-240	1.94E-03	
			Pu-241	3.66E-02		Pu-241	1.05E-02	
			Pu-242	2.77E-07		Pu-242	2.77E-07	
						Ra-223	9.65E-11	
						Ra-224	3.92E-17	
						Ra-225	1.16E-16	
						Ra-226	2.05E-11	
						Ra-228	4.63E-17	
			Rh-106	3.75E-03		Rh-106	4.78E-11	
						Rn-219	9.53E-11	
						Rn-220	3.93E-17	
						Rn-222	2.03E-11	
			Ru-106	2.81E-03		Ru-106	4.83E-11	
			Sb-125	1.56E-02		Sb-125	2.34E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.89E-01	
			Te-125m	6.48E-03		Te-125m	5.66E-06	
						Th-227	9.40E-11	
						Th-228	3.97E-17	
						Th-229	1.16E-16	
						Th-230	3.66E-09	
						Th-231	5.43E-07	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-232	6.11E-17	
						Th-234	4.95E-08	
						Tl-207	9.49E-11	
						Tl-208	1.41E-17	
						Tl-209	2.56E-18	
						U-233	1.80E-13	
			U-234	1.56E-05		U-234	1.57E-05	
			U-235	5.49E-07		U-235	5.50E-07	
			U-236	4.68E-08		U-236	4.83E-08	
						U-237	2.57E-07	
			U-238	5.00E-08		U-238	5.00E-08	
			Y-90	3.50E-01		Y-90	1.86E-01	
224	S852326	1985			2009	Ac-227	1.34E-10	300,000
			Ba-137m	9.59E-01		Ba-137m	5.49E-01	
						Bi-211	1.33E-10	
			Cs-137	1.02E+00		Cs-137	5.87E-01	
			Eu-155	1.91E-02		Eu-155	6.67E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	5.83E-02		Pm-147	1.03E-04	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	9.99E-03		Rh-106	5.04E-10	
						Rn-219	1.33E-10	
			Ru-106	7.49E-03		Ru-106	5.09E-10	
			Sb-125	4.16E-02		Sb-125	1.02E-04	
						Sm-147	1.43E-12	
			Sr-90	9.34E-01		Sr-90	5.27E-01	
			Te-125m	1.73E-02		Te-125m	2.48E-05	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-01		Y-90	5.21E-01	
224	S852328	1985			2009	Ac-227	1.34E-10	100,000
			Ba-137m	4.79E-01		Ba-137m	2.74E-01	
						Bi-211	1.33E-10	
			Cs-137	5.11E-01		Cs-137	2.93E-01	
			Eu-155	9.55E-03		Eu-155	3.34E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	2.92E-02		Pm-147	5.14E-05	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	5.00E-03		Rh-106	2.52E-10	
						Rn-219	1.33E-10	
			Ru-106	3.74E-03		Ru-106	2.55E-10	
			Sb-125	2.08E-02		Sb-125	5.12E-05	
						Sm-147	7.14E-13	
			Sr-90	4.67E-01		Sr-90	2.64E-01	
			Te-125m	8.63E-03		Te-125m	1.24E-05	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.61E-01	
224	S852332	1985			2009	Ac-227	1.34E-10	300,000
			Ba-137m	9.59E-01		Ba-137m	5.49E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-211	1.33E-10	
			Cs-137	1.02E+00		Cs-137	5.87E-01	
			Eu-155	1.91E-02		Eu-155	6.67E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	5.83E-02		Pm-147	1.03E-04	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	9.99E-03		Rh-106	5.04E-10	
						Rn-219	1.33E-10	
			Ru-106	7.49E-03		Ru-106	5.09E-10	
			Sb-125	4.16E-02		Sb-125	1.02E-04	
						Sm-147	1.43E-12	
			Sr-90	9.34E-01		Sr-90	5.27E-01	
			Te-125m	1.73E-02		Te-125m	2.48E-05	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-01		Y-90	5.21E-01	
224	S852804	1985			2009	Ac-227	2.92E-09	67,100,000
			Ba-137m	6.71E-01		Ba-137m	3.84E-01	
						Bi-211	2.88E-09	
			Cs-137	7.15E-01		Cs-137	4.11E-01	
			Eu-155	1.34E-02		Eu-155	4.67E-04	
						Fr-223	3.98E-11	
						Pa-231	9.70E-09	
						Pb-211	2.89E-09	
			Pm-147	4.08E-02		Pm-147	7.20E-05	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	8.80E-12	
						Po-215	2.89E-09	
			Pu-239	2.05E-01		Pu-239	2.04E-01	
						Ra-223	2.92E-09	
			Rh-106	6.99E-03		Rh-106	3.53E-10	
						Rn-219	2.88E-09	
			Ru-106	5.24E-03		Ru-106	3.57E-10	
			Sb-125	2.91E-02		Sb-125	7.18E-05	
						Sm-147	1.00E-12	
			Sr-90	6.54E-01		Sr-90	3.69E-01	
			Te-125m	1.21E-02		Te-125m	1.74E-05	
						Th-227	2.84E-09	
						Th-231	1.89E-05	
						Tl-207	2.87E-09	
			U-235	1.91E-05		U-235	1.91E-05	
			Y-90	6.53E-01		Y-90	3.65E-01	
224	S855064	1985			2009	Ac-227	5.00E-09	63,100,000
			Ba-137m	9.11E-01		Ba-137m	5.21E-01	
						Bi-211	4.94E-09	
			Cs-137	9.70E-01		Cs-137	5.57E-01	
			Eu-155	1.82E-02		Eu-155	6.34E-04	
						Fr-223	6.82E-11	
						Pa-231	1.66E-08	
						Pb-211	4.94E-09	
			Pm-147	5.54E-02		Pm-147	9.76E-05	
						Po-211	1.51E-11	
						Po-215	4.94E-09	
			Pu-239	2.23E-01		Pu-239	2.23E-01	
						Ra-223	5.00E-09	
			Rh-106	9.49E-03		Rh-106	4.79E-10	
						Rn-219	4.94E-09	
			Ru-106	7.12E-03		Ru-106	4.84E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sb-125	3.95E-02		Sb-125	9.74E-05	
						Sm-147	1.36E-12	
			Sr-90	8.87E-01		Sr-90	5.01E-01	
			Te-125m	1.64E-02		Te-125m	2.36E-05	
						Th-227	4.87E-09	
						Th-231	3.24E-05	
						Tl-207	4.92E-09	
			U-235	3.28E-05		U-235	3.28E-05	
			Y-90	8.86E-01		Y-90	4.95E-01	
224	S855065	1985			2009	Ac-227	5.00E-09	66,300,000
			Ba-137m	1.01E+00		Ba-137m	5.76E-01	
						Bi-211	4.94E-09	
			Cs-137	1.07E+00		Cs-137	6.16E-01	
			Eu-155	2.01E-02		Eu-155	7.01E-04	
						Fr-223	6.82E-11	
						Pa-231	1.66E-08	
						Pb-211	4.94E-09	
			Pm-147	6.13E-02		Pm-147	1.08E-04	
						Po-211	1.51E-11	
						Po-215	4.94E-09	
			Pu-239	2.23E-01		Pu-239	2.23E-01	
						Ra-223	5.00E-09	
			Rh-106	1.05E-02		Rh-106	5.29E-10	
						Rn-219	4.94E-09	
			Ru-106	7.86E-03		Ru-106	5.35E-10	
			Sb-125	4.37E-02		Sb-125	1.07E-04	
						Sm-147	1.50E-12	
			Sr-90	9.80E-01		Sr-90	5.54E-01	
			Te-125m	1.81E-02		Te-125m	2.60E-05	
						Th-227	4.87E-09	
						Th-231	3.24E-05	
						Tl-207	4.92E-09	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-235	3.28E-05		U-235	3.28E-05	
			Y-90	9.79E-01		Y-90	5.47E-01	
224	S855066	1985			2009	Ac-227	1.34E-10	70,000
			Ba-137m	3.59E-01		Ba-137m	2.06E-01	
						Bi-211	1.33E-10	
			Cs-137	3.83E-01		Cs-137	2.20E-01	
			Eu-155	7.17E-03		Eu-155	2.50E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	2.19E-02		Pm-147	3.86E-05	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	3.75E-03		Rh-106	1.89E-10	
						Rn-219	1.33E-10	
			Ru-106	2.81E-03		Ru-106	1.91E-10	
			Sb-125	1.56E-02		Sb-125	3.84E-05	
						Sm-147	5.35E-13	
			Sr-90	3.50E-01		Sr-90	1.98E-01	
			Te-125m	6.48E-03		Te-125m	9.30E-06	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.96E-01	
224	S855068	1985			2009	Ac-227	1.34E-10	20,000
			Ba-137m	3.59E-01		Ba-137m	2.06E-01	
						Bi-211	1.33E-10	
			Cs-137	3.83E-01		Cs-137	2.20E-01	
			Eu-155	7.17E-03		Eu-155	2.50E-04	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	2.19E-02		Pm-147	3.86E-05	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	3.75E-03		Rh-106	1.89E-10	
						Rn-219	1.33E-10	
			Ru-106	2.81E-03		Ru-106	1.91E-10	
			Sb-125	1.56E-02		Sb-125	3.84E-05	
						Sm-147	5.35E-13	
			Sr-90	3.50E-01		Sr-90	1.98E-01	
			Te-125m	6.48E-03		Te-125m	9.30E-06	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.96E-01	
225	S840848	1984			2009	Ac-227	1.44E-10	40,000
			Ba-137m	9.59E-02		Ba-137m	5.36E-02	
						Bi-211	1.42E-10	
			Cs-137	1.02E-01		Cs-137	5.73E-02	
			Eu-155	1.91E-03		Eu-155	5.80E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	5.83E-03		Pm-147	7.88E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	1.44E-10	
			Rh-106	9.99E-04		Rh-106	2.54E-11	
						Rn-219	1.42E-10	
			Ru-106	7.49E-04		Ru-106	2.56E-11	
			Sb-125	4.16E-03		Sb-125	7.97E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	5.15E-02	
			Te-125m	1.73E-03		Te-125m	1.93E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	5.09E-02	
225	S840854	1984			2009	Ac-227	1.44E-10	50,000
			Ba-137m	3.59E-01		Ba-137m	2.01E-01	
						Bi-211	1.42E-10	
			Cs-137	3.83E-01		Cs-137	2.15E-01	
			Eu-155	7.17E-03		Eu-155	2.18E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.19E-02		Pm-147	2.95E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	3.75E-03		Rh-106	9.51E-11	
						Rn-219	1.42E-10	
			Ru-106	2.81E-03		Ru-106	9.60E-11	
			Sb-125	1.56E-02		Sb-125	2.99E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.93E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	6.48E-03		Te-125m	7.25E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.91E-01	
225	S840856	1984			2009	Ac-227	1.44E-10	90,000
			Ba-137m	3.59E-01		Ba-137m	2.01E-01	
						Bi-211	1.42E-10	
			Cs-137	3.83E-01		Cs-137	2.15E-01	
			Eu-155	7.17E-03		Eu-155	2.18E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.19E-02		Pm-147	2.95E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	3.75E-03		Rh-106	9.51E-11	
						Rn-219	1.42E-10	
			Ru-106	2.81E-03		Ru-106	9.60E-11	
			Sb-125	1.56E-02		Sb-125	2.99E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.93E-01	
			Te-125m	6.48E-03		Te-125m	7.25E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.91E-01	
225	S840857	1984			2009	Ac-227	1.44E-10	105,000

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	7.19E-01		Ba-137m	4.02E-01	
						Bi-211	1.42E-10	
			Cs-137	7.66E-01		Cs-137	4.30E-01	
			Eu-155	1.43E-02		Eu-155	4.35E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	4.38E-02		Pm-147	5.90E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	7.49E-03		Rh-106	1.90E-10	
						Rn-219	1.42E-10	
			Ru-106	5.62E-03		Ru-106	1.92E-10	
			Sb-125	3.12E-02		Sb-125	5.98E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.86E-01	
			Te-125m	1.30E-02		Te-125m	1.45E-05	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-01		Y-90	3.82E-01	
225	S840863	1984			2009	Ac-227	1.44E-10	10,000
			Ba-137m	1.92E-02		Ba-137m	1.07E-02	
						Bi-211	1.42E-10	
			Cs-137	2.04E-02		Cs-137	1.15E-02	
			Eu-155	3.82E-04		Eu-155	1.16E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	1.17E-03		Pm-147	1.57E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	2.00E-04		Rh-106	5.07E-12	
						Rn-219	1.42E-10	
			Ru-106	1.50E-04		Ru-106	5.12E-12	
			Sb-125	8.32E-04		Sb-125	1.60E-06	
						Sm-147	2.86E-14	
			Sr-90	1.87E-02		Sr-90	1.03E-02	
			Te-125m	3.45E-04		Te-125m	3.87E-07	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.87E-02		Y-90	1.02E-02	
225	S840864	1984			2009	Ac-227	1.44E-10	25,000
			Ba-137m	7.19E-02		Ba-137m	4.02E-02	
						Bi-211	1.42E-10	
			Cs-137	7.66E-02		Cs-137	4.30E-02	
			Eu-155	1.43E-03		Eu-155	4.35E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	4.38E-03		Pm-147	5.92E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	7.49E-04		Rh-106	1.90E-11	
						Rn-219	1.42E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	5.62E-04		Ru-106	1.92E-11	
			Sb-125	3.12E-03		Sb-125	5.99E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.86E-02	
			Te-125m	1.30E-03		Te-125m	1.45E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.82E-02	
225	S840867	1984			2009	Ac-227	1.44E-10	30,000
			Ba-137m	9.59E-02		Ba-137m	5.36E-02	
						Bi-211	1.42E-10	
			Cs-137	1.02E-01		Cs-137	5.73E-02	
			Eu-155	1.91E-03		Eu-155	5.80E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	5.83E-03		Pm-147	7.88E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	9.99E-04		Rh-106	2.54E-11	
						Rn-219	1.42E-10	
			Ru-106	7.49E-04		Ru-106	2.56E-11	
			Sb-125	4.16E-03		Sb-125	7.97E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	5.15E-02	
			Te-125m	1.73E-03		Te-125m	1.93E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	5.09E-02	
225	S840874	1984			2009	Ac-227	1.44E-10	15,000
			Ba-137m	4.79E-02		Ba-137m	2.68E-02	
						Bi-211	1.42E-10	
			Cs-137	5.11E-02		Cs-137	2.87E-02	
			Eu-155	9.55E-04		Eu-155	2.90E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.92E-03		Pm-147	3.94E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	5.00E-04		Rh-106	1.27E-11	
						Rn-219	1.42E-10	
			Ru-106	3.74E-04		Ru-106	1.28E-11	
			Sb-125	2.08E-03		Sb-125	3.99E-06	
						Sm-147	7.14E-14	
			Sr-90	4.67E-02		Sr-90	2.58E-02	
			Te-125m	8.63E-04		Te-125m	9.66E-07	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-02		Y-90	2.55E-02	
226	S840842	1984			2009	Ac-227	1.44E-10	90,000
			Ba-137m	4.79E-01		Ba-137m	2.68E-01	
						Bi-211	1.42E-10	
			Cs-137	5.11E-01		Cs-137	2.87E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Eu-155	9.55E-03		Eu-155	2.90E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.92E-02		Pm-147	3.93E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	5.00E-03		Rh-106	1.27E-10	
						Rn-219	1.42E-10	
			Ru-106	3.74E-03		Ru-106	1.28E-10	
			Sb-125	2.08E-02		Sb-125	4.00E-05	
						Sm-147	7.14E-13	
			Sr-90	4.67E-01		Sr-90	2.58E-01	
			Te-125m	8.63E-03		Te-125m	9.67E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.55E-01	
226	S840843	1984			2009	Ac-227	1.44E-10	80,000
			Ba-137m	4.79E-01		Ba-137m	2.68E-01	
						Bi-211	1.42E-10	
			Cs-137	5.11E-01		Cs-137	2.87E-01	
			Eu-155	9.55E-03		Eu-155	2.90E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.92E-02		Pm-147	3.93E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	5.00E-03		Rh-106	1.27E-10	
						Rn-219	1.42E-10	
			Ru-106	3.74E-03		Ru-106	1.28E-10	
			Sb-125	2.08E-02		Sb-125	4.00E-05	
						Sm-147	7.14E-13	
			Sr-90	4.67E-01		Sr-90	2.58E-01	
			Te-125m	8.63E-03		Te-125m	9.67E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.55E-01	
226	S840844	1984			2009	Ac-227	1.44E-10	70,000
			Ba-137m	3.59E-01		Ba-137m	2.01E-01	
						Bi-211	1.42E-10	
			Cs-137	3.83E-01		Cs-137	2.15E-01	
			Eu-155	7.17E-03		Eu-155	2.18E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.19E-02		Pm-147	2.95E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	3.75E-03		Rh-106	9.51E-11	
						Rn-219	1.42E-10	
			Ru-106	2.81E-03		Ru-106	9.60E-11	
			Sb-125	1.56E-02		Sb-125	2.99E-05	
						Sm-147	5.36E-13	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sr-90	3.50E-01		Sr-90	1.93E-01	
			Te-125m	6.48E-03		Te-125m	7.25E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.91E-01	
226	S840845	1984			2009	Ac-227	1.44E-10	21,000
			Ba-137m	7.19E-02		Ba-137m	4.02E-02	
						Bi-211	1.42E-10	
			Cs-137	7.66E-02		Cs-137	4.30E-02	
			Eu-155	1.43E-03		Eu-155	4.35E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	4.38E-03		Pm-147	5.92E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	7.49E-04		Rh-106	1.90E-11	
						Rn-219	1.42E-10	
			Ru-106	5.62E-04		Ru-106	1.92E-11	
			Sb-125	3.12E-03		Sb-125	5.99E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.86E-02	
			Te-125m	1.30E-03		Te-125m	1.45E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.82E-02	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
226	S840846	1984			2009	Ac-227	1.44E-10	300,000
			Ba-137m	1.20E+00		Ba-137m	6.70E-01	
						Bi-211	1.42E-10	
			Cs-137	1.28E+00		Cs-137	7.16E-01	
			Eu-155	2.39E-02		Eu-155	7.26E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	7.29E-02		Pm-147	9.84E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	1.25E-02		Rh-106	3.17E-10	
						Rn-219	1.42E-10	
			Ru-106	9.36E-03		Ru-106	3.20E-10	
			Sb-125	5.20E-02		Sb-125	9.98E-05	
						Sm-147	1.79E-12	
			Sr-90	1.17E+00		Sr-90	6.44E-01	
			Te-125m	2.16E-02		Te-125m	2.42E-05	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.17E+00		Y-90	6.36E-01	
226	S840847	1984			2009	Ac-227	1.44E-10	70,000
			Ba-137m	3.59E-01		Ba-137m	2.01E-01	
						Bi-211	1.42E-10	
			Cs-137	3.83E-01		Cs-137	2.15E-01	
			Eu-155	7.17E-03		Eu-155	2.18E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pb-211	1.43E-10	
			Pm-147	2.19E-02		Pm-147	2.95E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	3.75E-03		Rh-106	9.51E-11	
						Rn-219	1.42E-10	
			Ru-106	2.81E-03		Ru-106	9.60E-11	
			Sb-125	1.56E-02		Sb-125	2.99E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.93E-01	
			Te-125m	6.48E-03		Te-125m	7.25E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.91E-01	
226	S840862	1984			2009	Ac-227	1.44E-10	15,000
			Ba-137m	4.79E-02		Ba-137m	2.68E-02	
						Bi-211	1.42E-10	
			Cs-137	5.11E-02		Cs-137	2.87E-02	
			Eu-155	9.55E-04		Eu-155	2.90E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.92E-03		Pm-147	3.94E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	5.00E-04		Rh-106	1.27E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Rn-219	1.42E-10	
			Ru-106	3.74E-04		Ru-106	1.28E-11	
			Sb-125	2.08E-03		Sb-125	3.99E-06	
						Sm-147	7.14E-14	
			Sr-90	4.67E-02		Sr-90	2.58E-02	
			Te-125m	8.63E-04		Te-125m	9.66E-07	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-02		Y-90	2.55E-02	
226	S840868	1984			2009	Ac-227	1.44E-10	35,000
			Ba-137m	7.19E-02		Ba-137m	4.02E-02	
						Bi-211	1.42E-10	
			Cs-137	7.66E-02		Cs-137	4.30E-02	
			Eu-155	1.43E-03		Eu-155	4.35E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	4.38E-03		Pm-147	5.92E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	7.49E-04		Rh-106	1.90E-11	
						Rn-219	1.42E-10	
			Ru-106	5.62E-04		Ru-106	1.92E-11	
			Sb-125	3.12E-03		Sb-125	5.99E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.86E-02	
			Te-125m	1.30E-03		Te-125m	1.45E-06	
						Th-227	1.40E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.82E-02	
227	S840877	1984			2009	Ac-227	3.21E-09	80,000
			Ba-137m	3.59E-01		Ba-137m	2.01E-01	
						Bi-211	3.17E-09	
			Cs-137	3.83E-01		Cs-137	2.15E-01	
			Eu-155	7.17E-03		Eu-155	2.18E-04	
						Fr-223	4.38E-11	
						Pa-231	1.03E-08	
						Pb-211	3.17E-09	
			Pm-147	2.19E-02		Pm-147	2.95E-05	
						Po-211	9.68E-12	
						Po-215	3.17E-09	
			Pu-239	1.36E-01		Pu-239	1.36E-01	
						Ra-223	3.21E-09	
			Rh-106	3.75E-03		Rh-106	9.51E-11	
						Rn-219	3.17E-09	
			Ru-106	2.81E-03		Ru-106	9.60E-11	
			Sb-125	1.56E-02		Sb-125	2.99E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.93E-01	
			Te-125m	6.48E-03		Te-125m	7.25E-06	
						Th-227	3.13E-09	
						Th-231	1.93E-05	
						Tl-207	3.16E-09	
			U-235	1.96E-05		U-235	1.96E-05	
			Y-90	3.50E-01		Y-90	1.91E-01	
227	S840878	1984			2009	Ac-227	5.19E-09	250,000
			Ba-137m	5.99E-01		Ba-137m	3.35E-01	
						Bi-211	5.13E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Cs-137	6.38E-01		Cs-137	3.58E-01	
			Eu-155	1.19E-02		Eu-155	3.63E-04	
						Fr-223	7.09E-11	
						Pa-231	1.67E-08	
						Pb-211	5.14E-09	
			Pm-147	3.65E-02		Pm-147	4.94E-05	
						Po-211	1.57E-11	
						Po-215	5.14E-09	
			Pu-239	1.92E-01		Pu-239	1.92E-01	
						Ra-223	5.19E-09	
			Rh-106	6.24E-03		Rh-106	1.58E-10	
						Rn-219	5.13E-09	
			Ru-106	4.68E-03		Ru-106	1.60E-10	
			Sb-125	2.60E-02		Sb-125	4.99E-05	
						Sm-147	8.93E-13	
			Sr-90	5.84E-01		Sr-90	3.22E-01	
			Te-125m	1.08E-02		Te-125m	1.21E-05	
						Th-227	5.06E-09	
						Th-231	3.13E-05	
						Tl-207	5.11E-09	
			U-235	3.17E-05		U-235	3.17E-05	
			Y-90	5.83E-01		Y-90	3.18E-01	
227	S840879	1984			2009	Ac-227	5.19E-09	300,000
			Ba-137m	9.59E-01		Ba-137m	5.36E-01	
						Bi-211	5.13E-09	
			Cs-137	1.02E+00		Cs-137	5.73E-01	
			Eu-155	1.91E-02		Eu-155	5.80E-04	
						Fr-223	7.09E-11	
						Pa-231	1.67E-08	
						Pb-211	5.14E-09	
			Pm-147	5.83E-02		Pm-147	7.87E-05	
						Po-211	1.57E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-215	5.14E-09	
			Pu-239	1.92E-01		Pu-239	1.92E-01	
						Ra-223	5.19E-09	
			Rh-106	9.99E-03		Rh-106	2.54E-10	
						Rn-219	5.13E-09	
			Ru-106	7.49E-03		Ru-106	2.56E-10	
			Sb-125	4.16E-02		Sb-125	7.99E-05	
						Sm-147	1.43E-12	
			Sr-90	9.34E-01		Sr-90	5.15E-01	
			Te-125m	1.73E-02		Te-125m	1.94E-05	
						Th-227	5.06E-09	
						Th-231	3.13E-05	
						Tl-207	5.11E-09	
			U-235	3.17E-05		U-235	3.17E-05	
			Y-90	9.33E-01		Y-90	5.09E-01	
227	S840880	1984			2009	Ac-227	5.19E-09	350,000
			Ba-137m	5.99E-01		Ba-137m	3.35E-01	
						Bi-211	5.13E-09	
			Cs-137	6.38E-01		Cs-137	3.58E-01	
			Eu-155	1.19E-02		Eu-155	3.63E-04	
						Fr-223	7.09E-11	
						Pa-231	1.67E-08	
						Pb-211	5.14E-09	
			Pm-147	3.65E-02		Pm-147	4.94E-05	
						Po-211	1.57E-11	
						Po-215	5.14E-09	
			Pu-239	1.92E-01		Pu-239	1.92E-01	
						Ra-223	5.19E-09	
			Rh-106	6.24E-03		Rh-106	1.58E-10	
						Rn-219	5.13E-09	
			Ru-106	4.68E-03		Ru-106	1.60E-10	
			Sb-125	2.60E-02		Sb-125	4.99E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Sm-147	8.93E-13	
			Sr-90	5.84E-01		Sr-90	3.22E-01	
			Te-125m	1.08E-02		Te-125m	1.21E-05	
						Th-227	5.06E-09	
						Th-231	3.13E-05	
						Tl-207	5.11E-09	
			U-235	3.17E-05		U-235	3.17E-05	
			Y-90	5.83E-01		Y-90	3.18E-01	
227	S840881	1984			2009	Ac-227	5.19E-09	200,000
			Ba-137m	7.19E-01		Ba-137m	4.02E-01	
						Bi-211	5.13E-09	
			Cs-137	7.66E-01		Cs-137	4.30E-01	
			Eu-155	1.43E-02		Eu-155	4.35E-04	
						Fr-223	7.09E-11	
						Pa-231	1.67E-08	
						Pb-211	5.14E-09	
			Pm-147	4.38E-02		Pm-147	5.90E-05	
						Po-211	1.57E-11	
						Po-215	5.14E-09	
			Pu-239	1.92E-01		Pu-239	1.92E-01	
						Ra-223	5.19E-09	
			Rh-106	7.49E-03		Rh-106	1.90E-10	
						Rn-219	5.13E-09	
			Ru-106	5.62E-03		Ru-106	1.92E-10	
			Sb-125	3.12E-02		Sb-125	5.98E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.86E-01	
			Te-125m	1.30E-02		Te-125m	1.45E-05	
						Th-227	5.06E-09	
						Th-231	3.13E-05	
						Tl-207	5.11E-09	
			U-235	3.17E-05		U-235	3.17E-05	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Y-90	6.99E-01		Y-90	3.82E-01	
227	S840883	1984			2009	Ac-227	1.44E-10	100,000
			Ba-137m	4.79E-01		Ba-137m	2.68E-01	
						Bi-211	1.42E-10	
			Cs-137	5.11E-01		Cs-137	2.87E-01	
			Eu-155	9.55E-03		Eu-155	2.90E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.92E-02		Pm-147	3.93E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	5.00E-03		Rh-106	1.27E-10	
						Rn-219	1.42E-10	
			Ru-106	3.74E-03		Ru-106	1.28E-10	
			Sb-125	2.08E-02		Sb-125	4.00E-05	
						Sm-147	7.14E-13	
			Sr-90	4.67E-01		Sr-90	2.58E-01	
			Te-125m	8.63E-03		Te-125m	9.67E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.55E-01	
227	S840885	1984			2009	Ac-227	3.82E-09	400,000
			Ba-137m	1.44E+00		Ba-137m	8.04E-01	
						Bi-211	3.77E-09	
			Cs-137	1.53E+00		Cs-137	8.60E-01	
			Eu-155	2.87E-02		Eu-155	8.70E-04	
						Fr-223	5.22E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pa-231	1.23E-08	
						Pb-211	3.78E-09	
			Pm-147	8.75E-02		Pm-147	1.18E-04	
						Po-211	1.15E-11	
						Po-215	3.78E-09	
			Pu-239	1.98E-01		Pu-239	1.98E-01	
						Ra-223	3.82E-09	
			Rh-106	1.50E-02		Rh-106	3.80E-10	
						Rn-219	3.78E-09	
			Ru-106	1.12E-02		Ru-106	3.84E-10	
			Sb-125	6.24E-02		Sb-125	1.20E-04	
						Sm-147	2.14E-12	
			Sr-90	1.40E+00		Sr-90	7.73E-01	
			Te-125m	2.59E-02		Te-125m	2.90E-05	
						Th-227	3.72E-09	
						Th-231	2.30E-05	
						Tl-207	3.76E-09	
			U-235	2.33E-05		U-235	2.33E-05	
			Y-90	1.40E+00		Y-90	7.64E-01	
227	S840886	1984			2009	Ac-227	1.44E-10	15,000
			Ba-137m	1.92E-01		Ba-137m	1.07E-01	
						Bi-211	1.42E-10	
			Cs-137	2.04E-01		Cs-137	1.15E-01	
			Eu-155	3.82E-03		Eu-155	1.16E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	1.17E-02		Pm-147	1.58E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Rh-106	2.00E-03		Rh-106	5.07E-11	
						Rn-219	1.42E-10	
			Ru-106	1.50E-03		Ru-106	5.12E-11	
			Sb-125	8.32E-03		Sb-125	1.59E-05	
						Sm-147	2.86E-13	
			Sr-90	1.87E-01		Sr-90	1.03E-01	
			Te-125m	3.45E-03		Te-125m	3.86E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.87E-01		Y-90	1.02E-01	
228	S874123	1987			2009	Ac-227	1.15E-10	9,000
			Ba-137m	3.59E-02		Ba-137m	2.15E-02	
						Bi-211	1.13E-10	
			Cs-137	3.83E-02		Cs-137	2.30E-02	
			Eu-155	7.17E-04		Eu-155	3.31E-05	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.19E-03		Pm-147	6.54E-06	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	3.75E-04		Rh-106	7.48E-11	
						Rn-219	1.13E-10	
			Ru-106	2.81E-04		Ru-106	7.56E-11	
			Sb-125	1.56E-03		Sb-125	6.34E-06	
						Sm-147	5.35E-14	
			Sr-90	3.50E-02		Sr-90	2.07E-02	
			Te-125m	6.48E-04		Te-125m	1.53E-06	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-02		Y-90	2.05E-02	
228	S874124	1987			2009	Ac-227	1.15E-10	20,000
			Ba-137m	3.59E-01		Ba-137m	2.15E-01	
						Bi-211	1.13E-10	
			Cs-137	3.83E-01		Cs-137	2.30E-01	
			Eu-155	7.17E-03		Eu-155	3.31E-04	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.19E-02		Pm-147	6.54E-05	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	3.75E-03		Rh-106	7.48E-10	
						Rn-219	1.13E-10	
			Ru-106	2.81E-03		Ru-106	7.56E-10	
			Sb-125	1.56E-02		Sb-125	6.34E-05	
						Sm-147	5.35E-13	
			Sr-90	3.50E-01		Sr-90	2.07E-01	
			Te-125m	6.48E-03		Te-125m	1.53E-05	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	2.05E-01	
228	S874125	1987			2009	Ac-227	1.15E-10	10,000
			Ba-137m	3.59E-02		Ba-137m	2.15E-02	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-211	1.13E-10	
			Cs-137	3.83E-02		Cs-137	2.30E-02	
			Eu-155	7.17E-04		Eu-155	3.31E-05	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.19E-03		Pm-147	6.54E-06	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	3.75E-04		Rh-106	7.48E-11	
						Rn-219	1.13E-10	
			Ru-106	2.81E-04		Ru-106	7.56E-11	
			Sb-125	1.56E-03		Sb-125	6.34E-06	
						Sm-147	5.35E-14	
			Sr-90	3.50E-02		Sr-90	2.07E-02	
			Te-125m	6.48E-04		Te-125m	1.53E-06	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-02		Y-90	2.05E-02	
228	S874126	1987			2009	Ac-227	1.15E-10	200,000
			Ba-137m	5.99E-01		Ba-137m	3.59E-01	
						Bi-211	1.13E-10	
			Cs-137	6.38E-01		Cs-137	3.84E-01	
			Eu-155	1.19E-02		Eu-155	5.52E-04	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	3.65E-02		Pm-147	1.09E-04	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	6.24E-03		Rh-106	1.25E-09	
						Rn-219	1.13E-10	
			Ru-106	4.68E-03		Ru-106	1.26E-09	
			Sb-125	2.60E-02		Sb-125	1.06E-04	
						Sm-147	8.91E-13	
			Sr-90	5.84E-01		Sr-90	3.46E-01	
			Te-125m	1.08E-02		Te-125m	2.56E-05	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	5.83E-01		Y-90	3.42E-01	
228	S874127	1987			2009	Ac-227	1.15E-10	
			Ba-137m	3.59E-01		Ba-137m	2.15E-01	
						Bi-211	1.13E-10	
			Cs-137	3.83E-01		Cs-137	2.30E-01	
			Eu-155	7.17E-03		Eu-155	3.31E-04	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.19E-02		Pm-147	6.54E-05	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	3.75E-03		Rh-106	7.48E-10	
						Rn-219	1.13E-10	
			Ru-106	2.81E-03		Ru-106	7.56E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sb-125	1.56E-02		Sb-125	6.34E-05	
						Sm-147	5.35E-13	
			Sr-90	3.50E-01		Sr-90	2.07E-01	
			Te-125m	6.48E-03		Te-125m	1.53E-05	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	2.05E-01	
228	S874128	1987			2009	Ac-227	1.15E-10	
			Ba-137m	3.59E-01		Ba-137m	2.15E-01	
						Bi-211	1.13E-10	
			Cs-137	3.83E-01		Cs-137	2.30E-01	
			Eu-155	7.17E-03		Eu-155	3.31E-04	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.19E-02		Pm-147	6.54E-05	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	3.75E-03		Rh-106	7.48E-10	
						Rn-219	1.13E-10	
			Ru-106	2.81E-03		Ru-106	7.56E-10	
			Sb-125	1.56E-02		Sb-125	6.34E-05	
						Sm-147	5.35E-13	
			Sr-90	3.50E-01		Sr-90	2.07E-01	
			Te-125m	6.48E-03		Te-125m	1.53E-05	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	2.05E-01	
228	S874129	1987			2009	Ac-227	1.15E-10	60,000
			Ba-137m	3.59E-01		Ba-137m	2.15E-01	
						Bi-211	1.13E-10	
			Cs-137	3.83E-01		Cs-137	2.30E-01	
			Eu-155	7.17E-03		Eu-155	3.31E-04	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.19E-02		Pm-147	6.54E-05	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	3.75E-03		Rh-106	7.48E-10	
						Rn-219	1.13E-10	
			Ru-106	2.81E-03		Ru-106	7.56E-10	
			Sb-125	1.56E-02		Sb-125	6.34E-05	
						Sm-147	5.35E-13	
			Sr-90	3.50E-01		Sr-90	2.07E-01	
			Te-125m	6.48E-03		Te-125m	1.53E-05	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	2.05E-01	
228	S874130	1987			2009	Ac-227	1.15E-10	80,000
			Ba-137m	4.79E-01		Ba-137m	2.87E-01	
						Bi-211	1.13E-10	
			Cs-137	5.11E-01		Cs-137	3.07E-01	
			Eu-155	9.55E-03		Eu-155	4.41E-04	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Fr-223	1.57E-12	
						Pa-231	4.09E-10	
						Pb-211	1.14E-10	
			Pm-147	2.92E-02		Pm-147	8.72E-05	
						Po-211	3.46E-13	
						Po-215	1.14E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.15E-10	
			Rh-106	5.00E-03		Rh-106	9.98E-10	
						Rn-219	1.13E-10	
			Ru-106	3.74E-03		Ru-106	1.01E-09	
			Sb-125	2.08E-02		Sb-125	8.45E-05	
						Sm-147	7.13E-13	
			Sr-90	4.67E-01		Sr-90	2.77E-01	
			Te-125m	8.63E-03		Te-125m	2.05E-05	
						Th-227	1.12E-10	
						Th-231	8.69E-07	
						Tl-207	1.13E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.73E-01	
229	S840851	1984			2009	Ac-227	1.44E-10	200,000
			Ba-137m	7.19E-01		Ba-137m	4.02E-01	
						Bi-211	1.42E-10	
			Cs-137	7.66E-01		Cs-137	4.30E-01	
			Eu-155	1.43E-02		Eu-155	4.35E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	4.38E-02		Pm-147	5.90E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	1.44E-10	
			Rh-106	7.49E-03		Rh-106	1.90E-10	
						Rn-219	1.42E-10	
			Ru-106	5.62E-03		Ru-106	1.92E-10	
			Sb-125	3.12E-02		Sb-125	5.98E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.86E-01	
			Te-125m	1.30E-02		Te-125m	1.45E-05	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-01		Y-90	3.82E-01	
229	S840855	1984			2009	Ac-227	1.44E-10	40,000
			Ba-137m	2.40E-01		Ba-137m	1.34E-01	
						Bi-211	1.42E-10	
			Cs-137	2.55E-01		Cs-137	1.43E-01	
			Eu-155	4.78E-03		Eu-155	1.45E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	1.46E-02		Pm-147	1.98E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	2.50E-03		Rh-106	6.34E-11	
						Rn-219	1.42E-10	
			Ru-106	1.87E-03		Ru-106	6.40E-11	
			Sb-125	1.04E-02		Sb-125	2.00E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.29E-01	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	4.32E-03		Te-125m	4.83E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.27E-01	
229	S840860	1984			2009	Ac-227	1.44E-10	150,000
			Ba-137m	4.79E-01		Ba-137m	2.68E-01	
						Bi-211	1.42E-10	
			Cs-137	5.11E-01		Cs-137	2.87E-01	
			Eu-155	9.55E-03		Eu-155	2.90E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.92E-02		Pm-147	3.93E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	5.00E-03		Rh-106	1.27E-10	
						Rn-219	1.42E-10	
			Ru-106	3.74E-03		Ru-106	1.28E-10	
			Sb-125	2.08E-02		Sb-125	4.00E-05	
						Sm-147	7.14E-13	
			Sr-90	4.67E-01		Sr-90	2.58E-01	
			Te-125m	8.63E-03		Te-125m	9.67E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.66E-01		Y-90	2.55E-01	
229	S840865	1984			2009	Ac-227	1.44E-10	10,000

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	2.40E-02		Ba-137m	1.34E-02	
						Bi-211	1.42E-10	
			Cs-137	2.55E-02		Cs-137	1.43E-02	
			Eu-155	4.78E-04		Eu-155	1.45E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	1.46E-03		Pm-147	1.97E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	2.50E-04		Rh-106	6.34E-12	
						Rn-219	1.42E-10	
			Ru-106	1.87E-04		Ru-106	6.40E-12	
			Sb-125	1.04E-03		Sb-125	2.00E-06	
						Sm-147	3.57E-14	
			Sr-90	2.33E-02		Sr-90	1.29E-02	
			Te-125m	4.32E-04		Te-125m	4.83E-07	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-02		Y-90	1.27E-02	
229	S840873	1984			2009	Ac-227	4.33E-09	100,000
			Ba-137m	4.79E-01		Ba-137m	2.68E-01	
						Bi-211	4.27E-09	
			Cs-137	5.11E-01		Cs-137	2.87E-01	
			Eu-155	9.55E-03		Eu-155	2.90E-04	
						Fr-223	5.91E-11	
						Pa-231	1.39E-08	
						Pb-211	4.28E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	2.92E-02		Pm-147	3.93E-05	
						Po-211	1.30E-11	
						Po-215	4.28E-09	
			Pu-239	1.86E-01		Pu-239	1.86E-01	
						Ra-223	4.33E-09	
			Rh-106	5.00E-03		Rh-106	1.27E-10	
						Rn-219	4.27E-09	
			Ru-106	3.74E-03		Ru-106	1.28E-10	
			Sb-125	2.08E-02		Sb-125	4.00E-05	
						Sm-147	7.14E-13	
			Sr-90	4.67E-01		Sr-90	2.58E-01	
			Te-125m	8.63E-03		Te-125m	9.67E-06	
						Th-227	4.21E-09	
						Th-231	2.61E-05	
						Tl-207	4.26E-09	
			U-235	2.64E-05		U-235	2.64E-05	
			Y-90	4.66E-01		Y-90	2.55E-01	
229	S840882	1984			2009	Ac-227	1.44E-10	18,000
			Ba-137m	7.19E-02		Ba-137m	4.02E-02	
						Bi-211	1.42E-10	
			Cs-137	7.66E-02		Cs-137	4.30E-02	
			Eu-155	1.43E-03		Eu-155	4.35E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	4.38E-03		Pm-147	5.92E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	7.49E-04		Rh-106	1.90E-11	
						Rn-219	1.42E-10	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ru-106	5.62E-04		Ru-106	1.92E-11	
			Sb-125	3.12E-03		Sb-125	5.99E-06	
						Sm-147	1.07E-13	
			Sr-90	7.00E-02		Sr-90	3.86E-02	
			Te-125m	1.30E-03		Te-125m	1.45E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-02		Y-90	3.82E-02	
229	S840888	1984			2009	Ac-227	1.44E-10	10,000
			Ba-137m	3.59E-02		Ba-137m	2.01E-02	
						Bi-211	1.42E-10	
			Cs-137	3.83E-02		Cs-137	2.15E-02	
			Eu-155	7.17E-04		Eu-155	2.18E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.19E-03		Pm-147	2.96E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	3.75E-04		Rh-106	9.51E-12	
						Rn-219	1.42E-10	
			Ru-106	2.81E-04		Ru-106	9.60E-12	
			Sb-125	1.56E-03		Sb-125	3.00E-06	
						Sm-147	5.36E-14	
			Sr-90	3.50E-02		Sr-90	1.93E-02	
			Te-125m	6.48E-04		Te-125m	7.25E-07	
						Th-227	1.40E-10	
						Th-231	8.69E-07	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-02		Y-90	1.91E-02	
230	S840831	1984			2009	Ac-227	8.84E-08	1000000+
			Ba-137m	8.39E+00		Ba-137m	4.69E+00	
						Bi-211	8.72E-08	
			Cs-137	8.94E+00		Cs-137	5.02E+00	
			Eu-155	1.67E-01		Eu-155	5.08E-03	
						Fr-223	1.21E-09	
						Pa-231	2.85E-07	
						Pb-211	8.74E-08	
			Pm-147	5.10E-01		Pm-147	6.92E-04	
						Po-211	2.66E-10	
						Po-215	8.74E-08	
			Pu-239	5.95E+00		Pu-239	5.95E+00	
						Ra-223	8.83E-08	
			Rh-106	8.74E-02		Rh-106	2.22E-09	
						Rn-219	8.73E-08	
			Ru-106	6.55E-02		Ru-106	2.24E-09	
			Sb-125	3.64E-01		Sb-125	6.99E-04	
						Sm-147	1.25E-11	
			Sr-90	8.17E+00		Sr-90	4.51E+00	
			Te-125m	1.51E-01		Te-125m	1.69E-04	
						Th-227	8.60E-08	
						Th-231	5.33E-04	
						Tl-207	8.69E-08	
			U-235	5.39E-04		U-235	5.39E-04	
			Y-90	8.16E+00		Y-90	4.45E+00	
230	S840835	1984			2009	Ac-227	1.44E-10	100,000
			Ba-137m	2.40E+00		Ba-137m	1.34E+00	
						Bi-211	1.42E-10	
			Cs-137	2.55E+00		Cs-137	1.43E+00	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Eu-155	4.78E-02		Eu-155	1.45E-03	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	1.46E-01		Pm-147	1.98E-04	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	2.50E-02		Rh-106	6.34E-10	
						Rn-219	1.42E-10	
			Ru-106	1.87E-02		Ru-106	6.40E-10	
			Sb-125	1.04E-01		Sb-125	1.99E-04	
						Sm-147	3.57E-12	
			Sr-90	2.33E+00		Sr-90	1.29E+00	
			Te-125m	4.32E-02		Te-125m	4.83E-05	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E+00		Y-90	1.27E+00	
230	S840836	1984			2009	Ac-227	1.44E-10	30,000
			Ba-137m	9.59E-02		Ba-137m	5.36E-02	
						Bi-211	1.42E-10	
			Cs-137	1.02E-01		Cs-137	5.73E-02	
			Eu-155	1.91E-03		Eu-155	5.80E-05	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	5.83E-03		Pm-147	7.88E-06	
						Po-211	4.35E-13	
						Po-215	1.43E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	9.99E-04		Rh-106	2.54E-11	
						Rn-219	1.42E-10	
			Ru-106	7.49E-04		Ru-106	2.56E-11	
			Sb-125	4.16E-03		Sb-125	7.97E-06	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	5.15E-02	
			Te-125m	1.73E-03		Te-125m	1.93E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	9.33E-02		Y-90	5.09E-02	
230	S840838	1984			2009	Ac-227	1.44E-10	400,000
			Ba-137m	1.20E+00		Ba-137m	6.70E-01	
						Bi-211	1.42E-10	
			Cs-137	1.28E+00		Cs-137	7.16E-01	
			Eu-155	2.39E-02		Eu-155	7.26E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	7.29E-02		Pm-147	9.84E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	1.25E-02		Rh-106	3.17E-10	
						Rn-219	1.42E-10	
			Ru-106	9.36E-03		Ru-106	3.20E-10	
			Sb-125	5.20E-02		Sb-125	9.98E-05	
						Sm-147	1.79E-12	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Sr-90	1.17E+00		Sr-90	6.44E-01	
			Te-125m	2.16E-02		Te-125m	2.42E-05	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.17E+00		Y-90	6.36E-01	
230	S840839	1984			2009	Ac-227	1.44E-10	90,000
			Ba-137m	3.59E-01		Ba-137m	2.01E-01	
						Bi-211	1.42E-10	
			Cs-137	3.83E-01		Cs-137	2.15E-01	
			Eu-155	7.17E-03		Eu-155	2.18E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	2.19E-02		Pm-147	2.95E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	3.75E-03		Rh-106	9.51E-11	
						Rn-219	1.42E-10	
			Ru-106	2.81E-03		Ru-106	9.60E-11	
			Sb-125	1.56E-02		Sb-125	2.99E-05	
						Sm-147	5.36E-13	
			Sr-90	3.50E-01		Sr-90	1.93E-01	
			Te-125m	6.48E-03		Te-125m	7.25E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	3.50E-01		Y-90	1.91E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
230	S840840	1984			2009	Ac-227	1.44E-10	90,000
			Ba-137m	2.40E-01		Ba-137m	1.34E-01	
						Bi-211	1.42E-10	
			Cs-137	2.55E-01		Cs-137	1.43E-01	
			Eu-155	4.78E-03		Eu-155	1.45E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	1.46E-02		Pm-147	1.98E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	2.50E-03		Rh-106	6.34E-11	
						Rn-219	1.42E-10	
			Ru-106	1.87E-03		Ru-106	6.40E-11	
			Sb-125	1.04E-02		Sb-125	2.00E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.29E-01	
			Te-125m	4.32E-03		Te-125m	4.83E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.27E-01	
230	S840841	1984			2009	Ac-227	1.44E-10	60,000
			Ba-137m	1.68E-01		Ba-137m	9.38E-02	
						Bi-211	1.42E-10	
			Cs-137	1.79E-01		Cs-137	1.00E-01	
			Eu-155	3.34E-03		Eu-155	1.02E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Pb-211	1.43E-10	
			Pm-147	1.02E-02		Pm-147	1.39E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	1.75E-03		Rh-106	4.44E-11	
						Rn-219	1.42E-10	
			Ru-106	1.31E-03		Ru-106	4.48E-11	
			Sb-125	7.28E-03		Sb-125	1.39E-05	
						Sm-147	2.50E-13	
			Sr-90	1.63E-01		Sr-90	9.01E-02	
			Te-125m	3.02E-03		Te-125m	3.38E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	1.63E-01		Y-90	8.91E-02	
230	S840859	1984			2009	Ac-227	1.44E-10	40,000
			Ba-137m	2.40E-01		Ba-137m	1.34E-01	
						Bi-211	1.42E-10	
			Cs-137	2.55E-01		Cs-137	1.43E-01	
			Eu-155	4.78E-03		Eu-155	1.45E-04	
						Fr-223	1.97E-12	
						Pa-231	4.65E-10	
						Pb-211	1.43E-10	
			Pm-147	1.46E-02		Pm-147	1.98E-05	
						Po-211	4.35E-13	
						Po-215	1.43E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.44E-10	
			Rh-106	2.50E-03		Rh-106	6.34E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Rn-219	1.42E-10	
			Ru-106	1.87E-03		Ru-106	6.40E-11	
			Sb-125	1.04E-02		Sb-125	2.00E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.29E-01	
			Te-125m	4.32E-03		Te-125m	4.83E-06	
						Th-227	1.40E-10	
						Th-231	8.69E-07	
						Tl-207	1.42E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.27E-01	
231	S855046	1985			2009	Ac-227	1.34E-10	1000000+
			Ba-137m	7.19E-01		Ba-137m	4.11E-01	
						Bi-211	1.33E-10	
			Cs-137	7.66E-01		Cs-137	4.40E-01	
			Eu-155	1.43E-02		Eu-155	5.01E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	4.38E-02		Pm-147	7.72E-05	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	7.49E-03		Rh-106	.78E-10	
						Rn-219	1.33E-10	
			Ru-106	5.62E-03		Ru-106	3.82E-10	
			Sb-125	3.12E-02		Sb-125	7.67E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.96E-01	
			Te-125m	1.30E-02		Te-125m	1.86E-05	
						Th-227	1.31E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	6.99E-01		Y-90	3.91E-01	
231	S855047	1985			2009	Ac-227	1.01E-10	1000000+
			Ba-137m	7.19E-01		Ba-137m	4.11E-01	
						Bi-211	9.94E-11	
			Cs-137	7.66E-01		Cs-137	4.40E-01	
			Eu-155	1.43E-02		Eu-155	5.01E-04	
						Fr-223	1.37E-12	
						Pa-231	3.35E-10	
						Pb-211	9.95E-11	
			Pm-147	4.38E-02		Pm-147	7.72E-05	
						Po-211	3.03E-13	
						Po-215	9.95E-11	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.01E-10	
			Rh-106	7.49E-03		Rh-106	3.78E-10	
						Rn-219	9.94E-11	
			Ru-106	5.62E-03		Ru-106	3.82E-10	
			Sb-125	3.12E-02		Sb-125	7.67E-05	
						Sm-147	1.07E-12	
			Sr-90	7.00E-01		Sr-90	3.96E-01	
			Te-125m	1.30E-02		Te-125m	1.86E-05	
						Th-227	9.80E-11	
						Th-231	6.52E-07	
						Tl-207	9.90E-11	
			U-235	6.60E-07		U-235	6.60E-07	
			Y-90	6.99E-01		Y-90	3.91E-01	
231	S855048	1985			2009	Ac-227	5.03E-09	100,000
			Ba-137m	2.16E-01		Ba-137m	1.23E-01	
						Bi-211	4.97E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Cs-137	2.30E-01		Cs-137	1.32E-01	
			Eu-155	4.30E-03		Eu-155	1.50E-04	
						Fr-223	6.87E-11	
						Pa-231	1.67E-08	
						Pb-211	4.98E-09	
			Pm-147	1.31E-02		Pm-147	2.32E-05	
						Po-211	1.52E-11	
						Po-215	4.98E-09	
						Ra-223	5.03E-09	
			Rh-106	2.25E-03		Rh-106	1.13E-10	
						Rn-219	4.97E-09	
			Ru-106	1.69E-03		Ru-106	1.15E-10	
			Sb-125	9.36E-03		Sb-125	2.30E-05	
						Sm-147	3.21E-13	
			Sr-90	2.10E-01		Sr-90	1.19E-01	
			Te-125m	3.89E-03		Te-125m	5.58E-06	
						Th-227	4.90E-09	
						Th-231	3.26E-05	
						Tl-207	4.95E-09	
			U-235	3.30E-05		U-235	3.30E-05	
			Y-90	2.10E-01		Y-90	1.17E-01	
231	S855049	1985			2009	Ac-227	3.02E-09	3,000
			Ba-137m	9.59E-02		Ba-137m	5.49E-02	
						Bi-211	2.98E-09	
			Cs-137	1.02E-01		Cs-137	5.87E-02	
			Eu-155	1.91E-03		Eu-155	6.67E-05	
						Fr-223	4.12E-11	
						Pa-231	1.00E-08	
						Pb-211	2.99E-09	
			Pm-147	5.83E-03		Pm-147	1.03E-05	
						Po-211	9.10E-12	
						Po-215	2.99E-09	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-223	3.02E-09	
			Rh-106	9.99E-04		Rh-106	5.04E-11	
						Rn-219	2.98E-09	
			Ru-106	7.49E-04		Ru-106	5.09E-11	
			Sb-125	4.16E-03		Sb-125	1.02E-05	
						Sm-147	1.43E-13	
			Sr-90	9.34E-02		Sr-90	5.27E-02	
			Te-125m	1.73E-03		Te-125m	2.48E-06	
						Th-227	2.94E-09	
						Th-231	1.96E-05	
						Tl-207	2.97E-09	
			U-235	1.98E-05		U-235	1.98E-05	
			Y-90	9.33E-02		Y-90	5.21E-02	
231	S856015	1985			2009	Ac-227	1.34E-10	1000000+
			Ba-137m	5.03E-01		Ba-137m	2.88E-01	
						Bi-211	1.33E-10	
			Cs-137	5.36E-01		Cs-137	3.08E-01	
			Eu-155	1.00E-02		Eu-155	3.50E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	
			Pm-147	3.06E-02		Pm-147	5.40E-05	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	5.24E-03		Rh-106	2.65E-10	
						Rn-219	1.33E-10	
			Ru-106	3.93E-03		Ru-106	2.67E-10	
			Sb-125	2.18E-02		Sb-125	5.37E-05	
						Sm-147	7.50E-13	
			Sr-90	4.90E-01		Sr-90	2.77E-01	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Te-125m	9.07E-03		Te-125m	1.30E-05	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	4.90E-01		Y-90	2.74E-01	
231	S856016	1985			2009	Ac-227	1.01E-10	20,000
			Ba-137m	1.44E+00		Ba-137m	8.23E-01	
						Bi-211	9.94E-11	
			Cs-137	1.53E+00		Cs-137	8.80E-01	
			Eu-155	2.87E-02		Eu-155	1.00E-03	
						Fr-223	1.37E-12	
						Pa-231	3.35E-10	
						Pb-211	9.95E-11	
			Pm-147	8.75E-02		Pm-147	1.54E-04	
						Po-211	3.03E-13	
						Po-215	9.95E-11	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.01E-10	
			Rh-106	1.50E-02		Rh-106	7.57E-10	
						Rn-219	9.94E-11	
			Ru-106	1.12E-02		Ru-106	7.64E-10	
			Sb-125	6.24E-02		Sb-125	1.53E-04	
						Sm-147	2.14E-12	
			Sr-90	1.40E+00		Sr-90	7.91E-01	
			Te-125m	2.59E-02		Te-125m	3.72E-05	
						Th-227	9.80E-11	
						Th-231	6.52E-07	
						Tl-207	9.90E-11	
			U-235	6.60E-07		U-235	6.60E-07	
			Y-90	1.40E+00		Y-90	7.82E-01	
231	S856017	1985			2009	Ac-227	1.01E-10	500,000

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Ba-137m	1.44E+00		Ba-137m	8.23E-01	
						Bi-211	9.94E-11	
			Cs-137	1.53E+00		Cs-137	8.80E-01	
			Eu-155	2.87E-02		Eu-155	1.00E-03	
						Fr-223	1.37E-12	
						Pa-231	3.35E-10	
						Pb-211	9.95E-11	
			Pm-147	8.75E-02		Pm-147	1.54E-04	
						Po-211	3.03E-13	
						Po-215	9.95E-11	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.01E-10	
			Rh-106	1.50E-02		Rh-106	7.57E-10	
						Rn-219	9.94E-11	
			Ru-106	1.12E-02		Ru-106	7.64E-10	
			Sb-125	6.24E-02		Sb-125	1.53E-04	
						Sm-147	2.14E-12	
			Sr-90	1.40E+00		Sr-90	7.91E-01	
			Te-125m	2.59E-02		Te-125m	3.72E-05	
						Th-227	9.80E-11	
						Th-231	6.52E-07	
						Tl-207	9.90E-11	
			U-235	6.60E-07		U-235	6.60E-07	
			Y-90	1.40E+00		Y-90	7.82E-01	
231	S856018	1985			2009	Ac-227	1.34E-10	350,000
			Ba-137m	2.40E-01		Ba-137m	1.37E-01	
						Bi-211	1.33E-10	
			Cs-137	2.55E-01		Cs-137	1.47E-01	
			Eu-155	4.78E-03		Eu-155	1.67E-04	
						Fr-223	1.83E-12	
						Pa-231	4.46E-10	
						Pb-211	1.33E-10	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
			Pm-147	1.46E-02		Pm-147	2.57E-05	
						Po-211	4.05E-13	
						Po-215	1.33E-10	
			Pu-239	6.20E-03		Pu-239	6.20E-03	
						Ra-223	1.34E-10	
			Rh-106	2.50E-03		Rh-106	1.26E-10	
						Rn-219	1.33E-10	
			Ru-106	1.87E-03		Ru-106	1.27E-10	
			Sb-125	1.04E-02		Sb-125	2.56E-05	
						Sm-147	3.57E-13	
			Sr-90	2.33E-01		Sr-90	1.32E-01	
			Te-125m	4.32E-03		Te-125m	6.20E-06	
						Th-227	1.31E-10	
						Th-231	8.69E-07	
						Tl-207	1.32E-10	
			U-235	8.80E-07		U-235	8.80E-07	
			Y-90	2.33E-01		Y-90	1.30E-01	
232	S874132	1987			2009	Ac-227	7.56E-10	6,500
						Ac-228	4.14E-16	
						Bi-210	2.81E-11	
						Bi-211	7.47E-10	
						Bi-212	4.16E-16	
						Bi-214	1.45E-10	
						Fr-223	1.03E-11	
						Pa-231	2.69E-09	
						Pa-234	1.89E-09	
						Pa-234m	1.46E-06	
						Pb-210	2.85E-11	
						Pb-211	7.48E-10	
						Pb-212	4.14E-16	
						Pb-214	1.45E-10	
						Po-210	2.84E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Po-211	2.28E-12	
						Po-212	2.65E-16	
						Po-214	1.45E-10	
						Po-215	7.48E-10	
						Po-216	4.14E-16	
						Po-218	1.43E-10	
						Ra-223	7.56E-10	
						Ra-224	4.14E-16	
						Ra-226	1.47E-10	
						Ra-228	4.89E-16	
						Rn-219	7.47E-10	
						Rn-220	4.14E-16	
						Rn-222	1.45E-10	
						Th-227	7.36E-10	
						Th-228	4.19E-16	
						Th-230	3.09E-08	
						Th-231	5.72E-06	
						Th-232	6.92E-16	
						Th-234	1.46E-06	
						Tl-207	7.43E-10	
						Tl-208	1.49E-16	
			U-234	1.56E-04		U-234	1.56E-04	
			U-235	5.79E-06		U-235	5.79E-06	
			U-236	6.37E-07		U-236	6.37E-07	
			U-238	1.47E-06		U-238	1.47E-06	
232	S874133	1987			2009	Ac-225	1.36E-13	
						Ac-227	3.87E-08	
						Ac-228	3.76E-16	
						Am-241	1.73E+00	
						At-217	1.37E-13	
						Bi-210	4.03E-12	
						Bi-211	3.82E-08	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Bi-212	3.78E-16	
						Bi-213	1.36E-13	
						Bi-214	2.66E-11	
						Fr-221	1.36E-13	
						Fr-223	5.29E-10	
						Np-237	7.29E-06	
						Pa-231	1.38E-07	
						Pa-233	7.23E-06	
						Pa-234	2.63E-08	
						Pa-234m	2.02E-05	
						Pb-209	1.36E-13	
						Pb-210	4.08E-12	
						Pb-211	3.83E-08	
						Pb-212	3.77E-16	
						Pb-214	2.67E-11	
						Po-210	4.08E-12	
						Po-211	1.17E-10	
						Po-212	2.41E-16	
						Po-213	1.33E-13	
						Po-214	2.67E-11	
						Po-215	3.83E-08	
						Po-216	3.76E-16	
						Po-218	2.62E-11	
			Pu-238	1.44E+00		Pu-238	1.21E+00	
			Pu-239	3.52E+00		Pu-239	3.52E+00	
			Pu-240	2.30E+00		Pu-240	2.29E+00	
			Pu-241	8.10E+01		Pu-241	2.81E+01	
			Pu-242	1.39E-03		Pu-242	1.39E-03	
						Ra-223	3.87E-08	
						Ra-224	3.76E-16	
						Ra-225	1.36E-13	
						Ra-226	2.70E-11	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Ra-228	4.44E-16	
						Rn-219	3.82E-08	
						Rn-220	3.76E-16	
						Rn-222	2.67E-11	
						Th-227	3.77E-08	
						Th-228	3.81E-16	
						Th-229	1.37E-13	
						Th-230	8.39E-09	
						Th-231	2.93E-04	
						Th-232	8.15E-16	
						Th-234	2.03E-05	
						Tl-207	3.81E-08	
						Tl-208	1.35E-16	
						Tl-209	3.00E-15	
						U-233	2.52E-10	
						U-234	8.24E-05	
			U-235	2.97E-04		U-235	2.97E-04	
						U-236	1.50E-06	
						U-237	6.90E-04	
			U-238	2.05E-05		U-238	2.05E-05	
232	S874134	1987			2009	Ac-225	4.30E-15	29,000
						Ac-227	3.18E-11	
						Ac-228	1.70E-16	
						Am-241	5.44E-02	
						At-217	4.30E-15	
						Bi-210	1.01E-12	
						Bi-211	3.14E-11	
						Bi-212	1.71E-16	
						Bi-213	4.29E-15	
						Bi-214	5.51E-12	
						Fr-221	4.29E-15	
						Fr-223	4.33E-13	

80% DRAFT

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Np-237	2.30E-07	
						Pa-231	1.13E-10	
						Pa-233	2.28E-07	
						Pa-234	2.09E-08	
						Pa-234m	1.61E-05	
						Pb-209	4.29E-15	
						Pb-210	1.02E-12	
						Pb-211	3.14E-11	
						Pb-212	1.70E-16	
						Pb-214	5.52E-12	
						Po-210	1.02E-12	
						Po-211	9.57E-14	
						Po-212	1.09E-16	
						Po-213	4.20E-15	
						Po-214	5.52E-12	
						Po-215	3.14E-11	
						Po-216	1.70E-16	
						Po-218	5.42E-12	
			Pu-238	7.36E-02		Pu-238	6.19E-02	
			Pu-239	4.63E-02		Pu-239	4.62E-02	
			Pu-240	4.76E-02		Pu-240	4.75E-02	
			Pu-241	2.55E+00		Pu-241	8.84E-01	
			Pu-242	6.59E-05		Pu-242	6.59E-05	
						Ra-223	3.17E-11	
						Ra-224	1.70E-16	
						Ra-225	4.30E-15	
						Ra-226	5.58E-12	
						Ra-228	2.01E-16	
						Rn-219	3.14E-11	
						Rn-220	1.70E-16	
						Rn-222	5.52E-12	
						Th-227	3.09E-11	

Appendix A-4 – Initial and Decayed Radionuclide and Dose Data for Lined Shafts

Shaft Number	Package ID	Base Year	Initial Isotopic Distribution		Target Year	Decayed Isotopic Distribution		Initial Contact Dose Rate (mR/hr)
			Isotope	Activity (Ci)		Isotope	Activity (Ci)	
						Th-228	1.72E-16	
						Th-229	4.30E-15	
						Th-230	1.31E-09	
						Th-231	2.41E-07	
						Th-232	2.88E-16	
						Th-234	1.61E-05	
						Tl-207	3.12E-11	
						Tl-208	6.12E-17	
						Tl-209	9.44E-17	
						U-233	7.94E-12	
			U-234	4.46E-06		U-234	8.68E-06	
			U-235	2.43E-07		U-235	2.44E-07	
			U-236	2.50E-07		U-236	2.81E-07	
						U-237	2.17E-05	
			U-238	1.63E-05		U-238	1.63E-05	