

[illegible]

Inst.#218559 PR215468		Source Ser. #	7
Initial Source Readings		Nuclide	Cs-137
Date	Result (µrem/hr)		
10/19/2006	176844		
10/19/2006	176997		
10/19/2006	178133		
10/19/2006	177205		
10/19/2006	177097		
10/19/2006	177692		
10/19/2006	177158		
10/19/2006	177621		
10/19/2006	177452		
10/19/2006	177190		
	Average		
	177339		

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Inst.#44-9 135696 PR145224		Source Ser. #	1161
Initial Source Readings		Nuclide	Tc-99
Date	Result (cpm)		
10/19/2006	2600		
10/19/2006	2500		
10/19/2006	2700		
10/19/2006	2600		
10/19/2006	2600		
10/19/2006	2800		
10/19/2006	2500		
10/19/2006	2600		
10/19/2006	2700		
10/19/2006	2700		
	Average		
	2630		

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Inst.#218559 PR215468		Source Ser. #	7
Initial Source Readings		Nuclide	Cs-137
Date	Result (µrem/hr)		
10/19/2006	176844		
10/19/2006	176997		
10/19/2006	178133		
10/19/2006	177205		
10/19/2006	177097		
10/19/2006	177692		
10/19/2006	177158		
10/19/2006	177621		
10/19/2006	177452		
10/19/2006	177190		
	Average		
	177339		

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

Counting Instrument:			2929		Detector:		43-10-1		Calibration Date:		1/9/2006									
Serial #:			180830		Serial #:		207489		12 month calibration:		OK									
Detector Active Area or Area Covered by Smear (cm ²):							100			NRC 6 Mo Cal. Due Date?		WARNING								
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	T _{1/2} (yr)	Source Decayed Activity	Required MDA (DPM/100cm ²)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source- Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm						
Alpha	0.3588	Th-230	1160	17,500	4/29/2002	7.54E+04	17,499	8	20	4	0.09	0.07	6279.3	67.97						
Beta	0.2849	Tc-99	1161	17,500	4/29/2002	2.13E+05	17,500	70	20	4	49.63	1.81	4986.5	85.75						
Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail		MDA α (dpm)	MDA β (dpm)	α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials		
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta								
10/23/2006	4	1002	25004	19936	0.2	50.1	6250.8	4933.9	PASS	PASS	PASS	PASS	4.34	47	Yes	Yes	Gbright	GB		
10/24/2006	1	1001	25048	20032	0.1	50.1	6262.0	4958.0	PASS	PASS	PASS	PASS	3.21	47	Yes	Yes	Gbright	GB		
10/25/2006	3	961	25145	20096	0.2	48.1	6286.1	4976.0	PASS	PASS	PASS	PASS	4.04	46	Yes	Yes	Gbright	GB		
10/26/2006	4	1014	24877	20168	0.2	50.7	6219.1	4991.3	PASS	PASS	PASS	PASS	4.34	48	Yes	Yes	Gbright	GB		
10/27/2006	2	1042	25142	19822	0.1	52.1	6285.4	4903.4	PASS	PASS	PASS	PASS	3.68	48	Yes	Yes	DKately	DK		
10/30/2006	2	1007	25208	20327	0.1	50.4	6301.9	5031.4	PASS	PASS	PASS	PASS	3.68	48	Yes	Yes	Gbright	GB		
10/31/2006	3	976	25092	20234	0.2	48.8	6272.9	5009.7	PASS	PASS	PASS	PASS	4.04	47	Yes	Yes	Gbright	GB		
11/1/2006	3	978	24921	19922	0.2	48.9	6230.1	4931.6	PASS	PASS	PASS	PASS	4.04	47	Yes	Yes	Gbright	GB		
11/2/2006	3	1059	24986	20138	0.2	53.0	6246.4	4981.6	PASS	PASS	PASS	PASS	4.04	49	Yes	Yes	Gbright	GB		
11/3/2006	3	977	24858	20201	0.2	48.9	6214.4	5001.4	PASS	PASS	PASS	PASS	4.04	47	Yes	Yes	Gbright	GB		
11/6/2006	3	1014	24998	20559	0.2	50.7	6249.4	5089.1	PASS	PASS	PASS	PASS	4.04	48	Yes	Yes	Gbright	GB		
11/7/2006	3	1002	24993	19803	0.2	50.1	6248.1	4900.7	PASS	PASS	PASS	PASS	4.04	47	Yes	Yes	Gbright	GB		
11/8/2006	1	1021	24798	20158	0.1	51.1	6199.5	4988.5	PASS	PASS	PASS	PASS	3.21	48	Yes	Yes	Gbright	GB		
11/9/2006	1	988	24660	19723	0.1	49.4	6165.0	4881.4	PASS	PASS	PASS	PASS	3.21	47	Yes	Yes	Gbright	GB		
11/13/2006	4	1013	24946	19515	0.2	50.7	6236.3	4828.1	PASS	PASS	PASS	PASS	4.34	48	Yes	Yes	Gbright	GB		
11/14/2006	4	924	24774	19655	0.2	46.2	6193.3	4867.6	PASS	PASS	PASS	PASS	4.34	46	Yes	Yes	Gbright	GB		
11/15/2006	4	1000	24853	19625	0.2	50.0	6213.1	4856.3	PASS	PASS	PASS	PASS	4.34	47	Yes	Yes	DKately	DK		
11/16/2006	2	1049	24828	19902	0.1	52.5	6206.9	4923.1	PASS	PASS	PASS	PASS	3.68	48	Yes	Yes	lharris	IH		
11/17/2006	3	1023	24846	19740	0.2	51.2	6211.4	4883.9	PASS	PASS	PASS	PASS	4.04	48	Yes	Yes	lharris	IH		
11/20/2006	4	1042	25220	20502	0.2	52.1	6304.8	5073.4	PASS	PASS	PASS	PASS	4.34	48	Yes	Yes	lharris	IH		
11/21/2006	4	934	25232	20154	0.2	46.7	6307.8	4991.8	PASS	PASS	PASS	PASS	4.34	46	Yes	Yes	lharris	IH		

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

#	Initial bkg counts				Initial source plus bkg counts			
	Alpha	cpm	Beta	cpm	Alpha	cpm	Beta	cpm
1	2	0.1	1053	52.65	25088	6272	19936	4984
2	0	0	1007	50.35	25116	6279	19876	4969
3	0	0	970	48.5	25248	6312	19820	4955
4	4	0.2	969	48.45	24924	6231	20064	5016
5	3	0.15	964	48.2	24764	6191	20252	5063
6	2	0.1	961	48.05	25564	6391	20344	5086
7	1	0.05	980	49	25304	6326	20576	5144
8	1	0.05	1001	50.05	24684	6171	20684	5171
9	3	0.15	1056	52.8	25368	6342	19628	4907
10	1	0.05	964	48.2	25116	6279	20264	5066
Mean		0.09		49.6		6279.4		5036.1
S _(n-1)		0.07		1.81		67.96		84.86
-3 sigma		-0.12		44.19		6075.51		4781.52
+3 sigma		0.29		55.06		6483.29		5290.68
-2 sigma		-0.05		46.00		6143.47		4866.38
+2 sigma		0.22		53.25		6415.33		5205.82
					Mean-bkg	6279.3		4986.5
					S _(n-1)	67.97		85.75
				Mean-bkg	-3 sigma	6075.40		4729.21
				Mean-bkg	+3 sigma	6483.23		5243.74
				Mean-bkg	-2 sigma	6143.37		4814.97
				Mean-bkg	+2 sigma	6415.26		5157.98
						6271.9		4931.35
						6279		4918.65
						6312		4906.5
						6230.8		4967.55
						6190.85		5014.8
						6390.9		5037.95
						6325.95		5095
						6170.95		5120.95
						6341.85		4854.2
						6278.95		5017.8

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CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

										Trial MDA Calculator	α	β
										Sample Count Time (min)	1	
Initial Background and Source Counts for Control Chart										Bkg Count Rate (cpm)	0.1	
#	Initial bkg counts				Initial source plus bkg counts					Bkg Count Time (min)	1	
	Alpha	cpm	Beta	cpm	Alpha	cpm	Beta	cpm		Counter Efficiency	0.178539	0.124156
1	5	5	286	286	3211	3211	2455	2455		MDCR (cpm)	4.471333	#DIV/0!
2	4	4	269	269	3121	3121	2427	2427		MDA (dpm)	25.04404	#DIV/0!
3	5	5	311	311	3084	3084	2543	2543				
4	4	4	271	271	3043	3043	2417	2417				
5	6	6	284	284	3222	3222	2518	2518				
6	6	6	317	317	3139	3139	2502	2502				
7	7	7	284	284	3077	3077	2431	2431				
8	4	4	302	302	3149	3149	2457	2457				
9	7	7	289	289	3135	3135	2408	2408				
10	6	6	326	326	3116	3116	2508	2508				
Mean		5.40		293.9		3129.7		2466.6				
S _(n-1)		1.17		19.29		56.04		47.61				
-3 sigma		1.88		236.03		2961.59		2323.76				
+3 sigma		8.92		351.77		3297.81		2609.44				
-2 sigma		3.05		255.32		3017.62		2371.38				
+2 sigma		7.75		332.48		3241.78		2561.82				
					Mean-bkg	3124.3		2172.7				
					S _(n-1)	55.91		36.99				
				Mean-bkg	-3 sigma	2956.56		2061.74				
				Mean-bkg	+3 sigma	3292.04		2283.66				
				Mean-bkg	-2 sigma	3012.47		2098.73				
				Mean-bkg	+2 sigma	3236.13		2246.67				
						3206		2169				
						3117		2158				
						3079		2232				
						3039		2146				
						3216		2234				
						3133		2185				
						3070		2147				
						3145		2155				
						3128		2119				
						3110		2182				

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CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

										Trial MDA Calculator	α	β
										Sample Count Time (min)	1	
										Bkg Count Rate (cpm)	0.1	
										Bkg Count Time (min)	1	
										Counter Efficiency	0.142663	0.28585
										MDCR (cpm)	4.471333	#DIV/0!
										MDA (dpm)	31.3419	#DIV/0!
Initial Background and Source Counts for Control Chart												
#	Initial bkg counts				Initial source plus bkg counts							
	Alpha	cpm	Beta	cpm	Alpha	cpm	Beta	cpm				
1	0	0	171	171	2519	2519	5156	5156				
2	0	0	147	147	2503	2503	5227	5227				
3	1	1	173	173	2562	2562	5148	5148				
4	1	1	194	194	2386	2386	5259	5259				
5	1	1	146	146	2406	2406	5111	5111				
6	1	1	180	180	2533	2533	5179	5179				
7	0	0	195	195	2489	2489	5212	5212				
8	1	1	187	187	2645	2645	5222	5222				
9	0	0	177	177	2424	2424	5106	5106				
10	3	3	188	188	2506	2506	5161	5161				
Mean		0.80		175.8		2497.3		5178.1				
S _(n-1)		0.92		17.45		77.47		50.99				
-3 sigma		-1.96		123.44		2264.88		5025.13				
+3 sigma		3.56		228.16		2729.72		5331.07				
-2 sigma		-1.04		140.89		2342.35		5076.12				
+2 sigma		2.64		210.71		2652.25		5280.08				
					Mean-bkg	2496.5		5002.3				
					S _(n-1)	77.38		47.06				
				Mean-bkg	-3 sigma	2264.37		4861.12				
				Mean-bkg	+3 sigma	2728.63		5143.48				
				Mean-bkg	-2 sigma	2341.75		4908.18				
				Mean-bkg	+2 sigma	2651.25		5096.42				
						2519		4985				
						2503		5080				
						2561		4975				
						2385		5065				
						2405		4965				
						2532		4999				
						2489		5017				
						2644		5035				
						2424		4929				
						2503		4973				

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CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

[illegible]

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 5)

										Trial MDA Calculator	α	β
										Sample Count Time (min)	1	
										Bkg Count Rate (cpm)	0.1	
										Bkg Count Time (min)	1	
										Counter Efficiency	0.159224	0
										MDCR (cpm)	4.471333	#DIV/0!
										MDA (dpm)	28.08206	#DIV/0!
Initial Background and Source Counts for Control Chart												
#	Initial bkg counts				Initial source plus bkg counts							
	Alpha	cpm	Beta	cpm	Alpha	cpm	Beta	cpm				
1	14	14			2816	2816						
2	10	10			2740	2740						
3	11	11			2692	2692						
4	9	9			2839	2839						
5	11	11			2916	2916						
6	6	6			2883	2883						
7	12	12			2970	2970						
8	13	13			2908	2908						
9	20	20			2638	2638						
10	9	9			2576	2576						
Mean		11.50		#DIV/0!		2797.8		#DIV/0!				
S _(n-1)		3.75		#DIV/0!		130.95		#DIV/0!				
-3 sigma		0.25		#DIV/0!		2404.96		#DIV/0!				
+3 sigma		22.75		#DIV/0!		3190.64		#DIV/0!				
-2 sigma		4.00		#DIV/0!		2535.91		#DIV/0!				
+2 sigma		19.00		#DIV/0!		3059.69		#DIV/0!				
					Mean-bkg	2786.3		#DIV/0!				
					S _(n-1)	131.84		#VALUE!				
				Mean-bkg	-3 sigma	2390.77		#DIV/0!				
				Mean-bkg	+3 sigma	3181.83		#DIV/0!				
				Mean-bkg	-2 sigma	2522.61		#DIV/0!				
				Mean-bkg	+2 sigma	3049.99		#DIV/0!				
						2802		#VALUE!				
						2730		#VALUE!				
						2681		#VALUE!				
						2830		#VALUE!				
						2905		#VALUE!				
						2877		#VALUE!				
						2958		#VALUE!				
						2895		#VALUE!				
						2618		#VALUE!				
						2567		#VALUE!				