



Hanford Tank Farms Vadose Zone Monitoring Project Quarterly Summary Report for 1st Quarter FY 2002

Introduction

Routine quarterly reports for the Hanford Tank Farms Vadose Zone Monitoring Project (VZMP) are issued to summarize the results of logging performed, provide the status of any on-going special investigations, and provide an updated listing of borehole intervals where logging is planned in the coming months.

The first quarterly report, issued in October 2001, updated the relevant aspects and progress of the project from its inception in June 2001 to September 2001.

VZMP Logging Results

A summary of logging operations from October 1 to December 31, 2001 is included in Table 1.

Table 1. Summary of Logging Operations

Month	October	November	December	FY Cumulative Total
Total Boreholes	14	20	20	54
Main Log Footage	743	1359	1249	3351
Rerun Log Footage	40	80	75	195
Total Footage	783	1439	1324	3546

Table 2 (attached) provides further details of operations including borehole number, tank number, logging depths and footage, the Radionuclide Assessment System (RAS) detector size (small, medium, large), total score, projected next logging date, the date of RAS logging events, and a comment section. This table is derived from the database "Prioritized Listing of Borehole Monitoring Intervals" included in the Baseline Monitoring Plan issued June 2001 (DOE 2001a). The database is continually updated as boreholes are logged. The most important change that occurs in the database is the log frequency. Where monitoring results suggest possible contaminant movement, the log frequency may be changed.

Profiles in some U and T Farm boreholes were identified during FY 2001 to exhibit possible contaminant movement and were placed on a quarterly monitoring schedule. These boreholes were re-logged during the first quarter of FY 2002. No significant changes could be detected during this short time interval, and the logging frequency was changed to biannual for the T Farm boreholes. The U Farm boreholes remain on a quarterly schedule, primarily because waste retrieval operations are being conducted in a nearby tank.

Since October 2001, possible contaminant movement has been identified in four additional boreholes (22-03-04, 22-07-02, 22-07-05, and 22-08-05) in BY Farm. The attached plots show a comparison of the current RAS and the Spectral Gamma Logging System (SGLS) baseline total gamma profiles for these boreholes and indicate the depth intervals of suspected contaminant movement. The dominant contaminant in each of these boreholes is cobalt-60 (^{60}Co). The count rates have not been corrected for decay. These boreholes were originally

selected for a biannual monitoring frequency and are proposed to remain on that schedule. In the interest of brevity, plots for boreholes where no apparent change was observed will not be included in this report. These logs are available on request.

During FY 2001, one or more regions of high gamma flux that are beyond the range of the RAS detection system were identified to exist in 11 boreholes that were monitored. An additional nine boreholes were identified during the first quarter of FY 2002 for a total of 20 since the beginning of the project. The high rate logging system (HRLS) is required to collect data in these boreholes to assess potential changes. For more efficient scheduling of personnel and equipment, it is recommended that more boreholes be identified before special logging with the HRLS is initiated.

Special Investigations

A special investigation of boreholes around tank U-107 (U Farm) was requested by the DOE-ORP Project Manager to support waste retrieval operations conducted by CH2M Hill Hanford Group (CHG). A preliminary report issued in October 2001 documented the results of the June FY 2001 logging and provided recommendations for monitoring frequency during ongoing waste retrieval operations (Henwood 2001). Nine boreholes in the vicinity of tank U-107, four of which show indications of contaminant migration, were recommended for quarterly monitoring. Thus, a second round of logging was initiated in these boreholes and was completed in October. No further contaminant movement could be discerned when comparing the log profiles from the logging events conducted in June and October. The third logging event for these boreholes was initiated on December 26, 2001. Six of the nine boreholes have been logged as of December 31, 2001. Again, none of the borehole logs has shown indications of contaminant movement. Borehole 60-07-10 is included in this report as a typical example of a U Farm borehole to illustrate the apparent lack of movement as determined from RAS measurements. Profiles for the RAS total gamma and the RAS protactinium-234 (^{234}Pa) window that includes the 1001-keV energy peak are shown in the example. It is likely that the time elapsed between logging events was not sufficient to detect slow movement of contaminants in the vadose zone. It is recommended these boreholes continue to be monitored on a quarterly basis until the waste retrieval operations are completed. The data will then be evaluated, a final report issued on the findings, and the monitoring frequency adjusted as appropriate.

No other special logging investigation requests or other re-prioritization of boreholes for monitoring have been received or identified during this reporting period.

Operational Issues

During the first quarter of FY 2001 logging, it was determined an average of 1.5 boreholes were logged each working day. This rate included all operational aspects of logging, including both scheduled and unscheduled downtime for maintenance, operator support, security, etc. The rate of logging achieved during the first quarter of FY 2002 was about 1.0 borehole per day. Tables 3a and 3b include summaries of production and operational issues, respectively, that affect logging production.

Table 3a. Summary of Logging Production

Quarter	Total Work Days	Total Days Down	Total Boreholes Logged	Boreholes Logged per Day
4 th of FY01	56	29.3	84	1.5
1 st of FY02	56	35.2	54	1.0
2 nd of FY02	N/A ¹	N/A	N/A	N/A
3 rd of FY02	N/A	N/A	N/A	N/A
Cumulative Total	112	64.5	138	N/A
Average/Quarter	56	32.25	69	1.25

¹N/A – not applicable

Table 3b. Summary of Operational Down Time

Quarter	Equipment/ Truck Problems (hrs)	No HPT/ Operator Support (hrs)	Security Measures (hrs)	No Charge Code or Administrative (hrs)	Moving Truck (hrs)	Weather (hrs)	Misc. (hrs)	Total Down Time (hrs)
4 th of FY01	64	130	20	27	20	3	0	264
1 st of FY02	107	84	51	44	14	13	4	317
2 nd of FY02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 rd of FY02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative Total	171	214	71	71	34	16	4	581
Average/Quarter	85.5	107	35.5	35.5	17	8	2	290.5

Corrective actions have been implemented to improve the efficiency of the logging operations. These actions include exempting the operators from the morning meetings, increasing the priority of the RAS monitoring project, and increasing the service interval of the truck from 200 hours to 400 hours.

The primary objectives of the monitoring project are: 1) monitoring known plumes at a reasonable frequency, 2) logging each borehole at least once in a five-year period, and 3) responding to special requests. With the current logging system, it will not be possible to meet these objectives, even when all the correctives measures discussed above are fully implemented. A “Lessons Learned” document was issued in December 2001 that documented the experience gained during and after the implementation of the RAS (DOE 2001b). Recommendations were

made to improve the logging capabilities for the monitoring project. Implementing corrective actions for operational issues and procurement of an additional improved logging system would assure the attainment of the VZMP objectives.

Future Logging Operations

Table 4 (attached) provides a summary by tank farm of boreholes prioritized and available for logging through the end of the second quarter of FY 2002. This list includes all boreholes with a total score in excess of 30 and a next log date that is overdue or will become overdue within 90 days and likely contains more boreholes than can actually be logged during the quarter. At a minimum, it is anticipated tank farms U, T, BX, SX, and C will be visited during the second quarter of FY 2002.

References

Henwood, P., 2001. Letter Report, Subject: "Preliminary Evaluation of Log Data in the Vicinity of Tank U-107," MACTEC-ERS, Richland, Washington.

U.S. Department of Energy (DOE), 2001a. *Hanford Tank Farms Vadose Zone Monitoring Project, Baseline Monitoring Plan*, MAC-HGLP 1.8.1, Revision 0, Grand Junction Office, Grand Junction, Colorado.

U.S. Department of Energy (DOE), 2001b. Memorandum from Joel Berwick (DOE-GJO) to Rob Yasek (DOE-ORP), Subject: "Transmittal of Lessons Learned for the Radionuclide Assessment System" (report attached), Grand Junction Office, Grand Junction, Colorado.

Table 2. Boreholes Logged During First Quarter FY 2002

Borehole Number	Tank	Top	Bottom	Footage	Rerun Footage	RAS Detector	Plume Score	Total Score	Next Log Date	RAS Event A	RAS Event B	RAS Event C	Comment
60-08-04	U-108	35	100	65	10	L	1.5	57	03/28/02	07/09/01	10/25/01	12/28/01	No apparent change
60-07-10	U-107	40	99	59		L	2	88	03/27/02	07/09/01	10/24/01	12/27/01	Apparent change (SGLS); 53-65 ft; no change between RAS events
60-07-11	U-107	40	100	60		L	2	88	03/27/02	07/12/01	10/24/01	12/27/01	Apparent change (SGLS) 73-95 ft; no change between RAS events
60-10-01	U-110	35	75	40		L	0	11	03/27/02	07/17/01	10/04/01	12/27/01	No apparent change
60-07-01	U-107	40	99	59	10	L	2	88	03/26/02	07/12/01	10/04/01	12/26/01	Apparent change (SGLS) 83-88 ft; no change between RAS events
60-07-02	U-107	35	100	65		L	0.75	56	03/26/02	07/12/01	10/04/01	12/26/01	No apparent change
22-03-05	BY-103	20	99	83		S/M	1.5	50	12/15/02	12/20/01			No apparent change; requires HRLS
22-06-09	BY-106	40	97	57	10	L	0.5	39	11/23/06	12/19/01			No apparent change
22-07-09	BY-107	20	99	84		L/M	1.5	55	12/14/02	12/19/01			No apparent change
22-08-05	BY-108	35	98	63		L	2	74	06/15/02	12/17/01			Apparent change 75-82 ft (SGLS)
22-08-07	BY-108	40	100	60		L	1	49	12/12/02	12/17/01			No apparent change
22-08-01	BY-108	25	99	74	10	L	1.5	61	12/09/02	12/14/01			No apparent change
22-08-06	BY-108	40	99	59	10	L	1.5	61	12/09/02	12/14/01			No apparent change
22-08-02	BY-108	25	103	78		L	2	74	06/11/02	12/13/01			No apparent change
22-08-12	BY-108	30	90	60		L	2	74	06/11/02	12/13/01			No apparent change
22-07-05	BY-107	30	97	67	15	L	2	68	06/10/02	12/12/01			Apparent change 75-81 ft (SGLS)
22-07-07	BY-107	40	99	59		L	2	68	06/10/02	12/12/01			No apparent change
22-10-05	BY-110	40	99	59	10	L	1.5	41	12/06/02	12/11/01			No apparent change
22-10-07	BY-110	40	80	40		L	2	53	06/09/02	12/11/01			No apparent change
22-07-01	BY-107	40	98	58		L	1	43	12/01/02	12/06/01			No apparent change
22-07-02	BY-107	30	100	70		L	2	68	05/28/02	11/29/01			Apparent change 98-100 ft (SGLS)
22-06-07	BY-106	35	132	97		L	1.5	64	11/23/02	11/28/01			No apparent change
22-06-01	BY-106	40	80	40	15	L	1	51	11/22/02	11/27/01			No apparent change
22-06-05	BY-106	20	98	78		L	2	76	05/26/02	11/27/01			No apparent change
22-03-07	BY-103	40	99	59	10	L	1	38	11/21/02	11/26/01			No apparent change
22-03-09	BY-103	30	98	68	15	L	1	38	11/21/02	11/26/01			No apparent change
22-00-03	BY-103	40	146	106		L	1.5	50	11/14/02	11/19/01			No apparent change
22-03-08	BY-103	40	99	59		L	1	38	11/14/02	11/19/01			No apparent change
22-03-06	BY-103	40	101	61		L	1	38	11/11/02	11/16/01			No apparent change
22-00-02	BY-103	40	99	59		L	2	63	05/14/02	11/15/01			No apparent change
22-03-04	BY-103	40	101	61	15	L	2	63	05/14/02	11/15/01			Apparent change 77-82 ft (SGLS)
22-05-01	BY-105	40	98	58		L	1.5	62	11/09/02	11/14/01			No apparent change
22-05-09	BY-105	40	98	58		L	1.5	62	11/09/02	11/14/01			No apparent change
50-06-03	T-106	30	118	88		M	2	143	05/11/02	07/18/01	11/12/01		Apparent change at 115 ft (SGLS); no change between RAS events
50-01-09	T-101	30	90	60	10	M	2	62	05/07/02	07/30/01	11/08/01		Apparent change at 86-90 ft (SGLS); no change between RAS events
50-09-01	T-109	30	86	56	15	M	2	54	05/07/02	07/23/01	11/08/01		Apparent change at 85 ft (SGLS); no change between RAS events
50-06-02	T-106	30	122	92		M	2	143	05/06/02	07/19/01	11/07/01		Apparent change at 110 ft (SGLS); no change between RAS events
50-09-10	T-109	30	120	90		M	2	54	05/06/02	07/23/01	11/07/01		Apparent change at 76 and 94 ft (SGLS); no change between RAS events
60-12-01	U-112	35	125	60		M/S	1	37	11/01/02	11/06/01			No apparent change; requires HRLS
60-11-12	U-111	35	75	40		L	1	37	10/31/02	11/05/01			No apparent change
60-11-07	U-111	35	75	40	10	L	1	37	10/20/02	10/25/01			No apparent change
60-05-04	U-105	35	73	38		L	1.5	44	01/22/02	07/16/01	10/24/01		No apparent change
60-04-08	U-104	40	104	64		L	2	94	01/20/02	07/16/01	10/22/01		Apparent change 74-78 and 84-89 ft (SGLS); no change between RAS events
60-10-11	U-110	35	75	40		L	0	11	01/02/02	07/17/01	10/04/01		No apparent change
41-09-07	SX-109	40	73	35		L/S	2	58	04/01/02	10/03/01			No apparent change; requires HRLS

Table 2. Boreholes Logged During First Quarter FY 2002

<i>Borehole Number</i>	<i>Tank</i>	<i>Top</i>	<i>Bottom</i>	<i>Footage</i>	<i>Rerun Footage</i>	<i>RAS Detector</i>	<i>Plume Score</i>	<i>Total Score</i>	<i>Next Log Date</i>	<i>RAS Event A</i>	<i>RAS Event B</i>	<i>RAS Event C</i>	<i>Comment</i>
41-09-09	SX-109	40	95	67	10	L/S	2	58	04/01/02	10/03/01			No apparent change
41-12-02	SX-112	40	122	72		L/S	1.5	63	09/28/02	10/03/01			No apparent change; requires HRLS
41-12-03	SX-112	40	76	41		L/S	1.5	63	09/28/02	10/03/01			No apparent change

Table 4. Boreholes Projected for Logging During Second Quarter of FY 2002

Borehole Number	Tank	Top	Bottom	Footage	Rerun Footage	RAS Detector	Plume Score	Total Score	Next Log Date	RAS Event A	RAS Event B	RAS Event C	Comment
10-02-01	A-102	45	95	50			1	32	11/13/97				
10-02-03	A-102	45	125	80			1	32	10/27/97				
10-02-08	A-102	45	95	50			1	32	11/03/97				BE - Cs-137
10-03-07	A-103	45	125	80			1	37	10/20/97				
11-01-01	AX-101	45	85	40			0	66	07/28/01				BE - Cs-137
11-01-02	AX-101	45	85	40			0	66	07/27/01				BE - Cs-137
11-01-04	AX-101	45	85	40			0	66	07/28/01				BE - Cs-137
11-01-05	AX-101	45	85	40			0	66	07/27/01				
11-01-07	AX-101	45	85	40			0	66	07/26/01				BE - Cs-137
11-01-09	AX-101	45	85	40			0	66	07/31/01				BE - Cs-137
11-01-10	AX-101	45	73	28			0	66	08/01/01				BE - Cs-137
11-01-11	AX-101	45	85	40			0	66	08/02/01				BE - Cs-137
11-03-02	AX-103	20	90	70			1	32	09/08/97				Cs-137 at 35 ft
20-00-05	B-101	35	110	75			1	39	08/16/98				Double casing
20-01-01	B-101	35	75	40			1	39	08/15/98				Hist. - short life at 54 ft
20-01-06	B-101	25	60	35			1	39	08/21/98				
20-03-06	B-103	35	75	40			1	35	04/30/00				BE - Cs-137; hist. at 37 ft
20-02-09	B-105	35	100	65			1	34	09/11/98				BE - Cs-137
20-05-06	B-105	35	120	85			1	34	08/20/98				BE - Cs-137 - 55-120 ft
20-06-03	B-106	35	75	40			1	33	11/13/99				
20-06-06	B-106	35	100	1			1	33	04/30/00				BE - Cs-137 - 58-100 ft
20-07-02	B-107	35	100	65			1	38	11/27/99				BE - Cs-137 - 63-76 ft
20-07-11	B-107	35	80	45			1	38	05/05/00				Possible Sr-90 at 72 ft
20-09-06	B-109	35	100	65			1	31	09/14/98				
20-12-03	B-109	35	100	65			1	31	11/01/99				BE - Cs-137; hist. 60-90 ft
20-10-02	B-110	20	98	78			1	37	04/28/00				Possible Sr-90; BE - Cs-137
20-10-07	B-110	35	75	40			1	37	11/19/99				Hist. at 47 ft
20-10-12	B-110	20	120	100			1	37	10/22/99				BE - Cs-137 - 108-120 ft; Sr-90
20-11-09	B-111	35	75	40			1	35	08/28/98				
20-12-06	B-111	35	75	40			1	35	10/29/99				Possible Sr-90 at 45 ft
21-00-05	BX-101	35	125	90			1	33	05/23/98				BE - Cs-137
21-01-01	BX-101	15	100	85			1	33	05/11/98				Past instability Sb-125 - 21 pCi/g
21-01-02	BX-101	35	100	65			1	33	03/05/00				BE - Cs-137; past instability
21-27-01	BX-102	35	99	64	10	L	2	106	02/24/02	08/28/01			No apparent change
21-27-11	BX-102	30	138	108		L	2	106	02/16/02	08/20/01			No apparent change
21-02-03	BX-102	35	99	64	15	L	2	106	02/10/02	08/14/01			No apparent change
21-27-08	BX-102	35	149	114		L	2	106	02/10/02	08/14/01			No apparent change
21-03-03	BX-103	35	90	55		L	2	54	02/24/02	08/28/01			No apparent change
21-00-09	BX-111	35	60	25			1	32	07/30/98				
21-00-21	BX-111	35	90	55			1	32	08/01/98				BE - Cs-137
21-00-22	BX-111	30	73	43			1	32	08/02/98				BE - Cs-137
21-11-03	BX-111	35	99	64			1	32	07/24/98				
21-11-04	BX-111	35	60	25			1	32	07/23/98				
21-11-05	BX-111	35	75	40			1	32	11/04/00				
21-11-07	BX-111	35	75	40			1	32	11/04/00				
22-00-04	BY-102	40	99	59			1	31	07/26/96				BE - Cs-137
22-02-01	BY-102	40	98	58			1	31	07/18/96				
22-02-07	BY-102	170	260	90			1	31	03/30/00				BE - Cs-137; Co-60, Cs-137 at groundwater

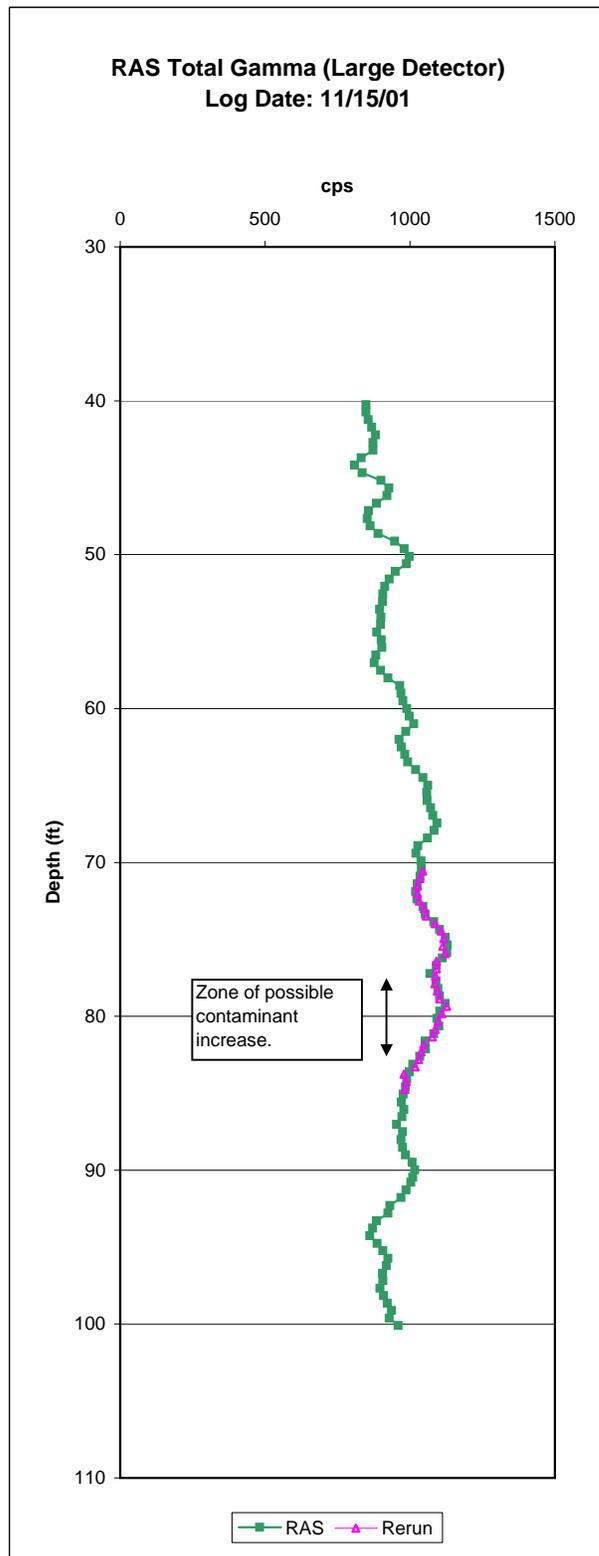
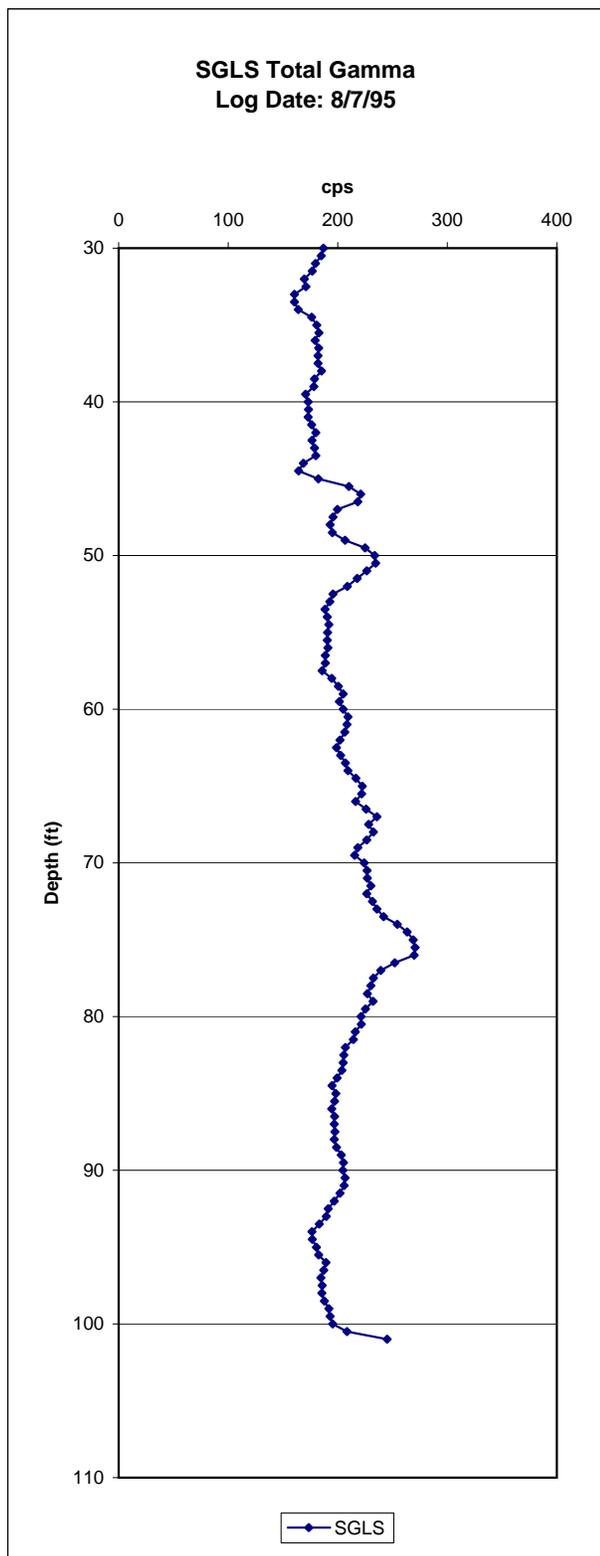
Table 4. Boreholes Projected for Logging During Second Quarter of FY 2002

Borehole Number	Tank	Top	Bottom	Footage	Rerun Footage	RAS Detector	Plume Score	Total Score	Next Log Date	RAS Event A	RAS Event B	RAS Event C	Comment
22-02-09	BY-102	20	80	60			1	31	03/23/00				TGA 40-50 ft; BE - Cs-137
22-04-07	BY-104	40	100	60			1	31	07/28/96				BE - Cs-137; Co-60 - 90-99 ft
22-04-09	BY-104	40	124	84			1	31	08/02/96				BE - Cs-137; Co-60 - 85-124 ft
30-01-01	C-101	30	70	40			0.5	31	02/28/02				BE - Cs-137
30-01-06	C-101	30	70	40			1	43	03/23/98				
30-01-09	C-101	20	70	50			1	43	03/19/98				
30-00-03	C-102	30	70	40			0	37	03/20/02				BE - Cs-137
30-03-01	C-103	30	125	95			1	54	04/12/98				BE - Cs-137
30-03-03	C-103	30	98	68			1	54	04/06/98				BE - Cs-137
30-03-09	C-103	30	98	68			1	54	04/03/98				BE - Cs-137
30-05-02	C-105	30	90	60			1	31	01/31/98				BE - Cs-137
30-05-03	C-105	30	90	60			1	31	01/29/98				BE - Cs-137
30-05-04	C-105	30	118	88			1	31	01/24/98				BE - Cs-137
30-05-05	C-105	30	98	68			1	31	01/24/98				BE - Cs-137
30-05-07	C-105	30	67	37			1	31	12/14/00				
30-05-08	C-105	30	49	19			1	31	01/19/98				BE - Cs-137
30-05-10	C-105	10	70	60			1	31	01/10/98				BE - Cs-137
30-00-01	C-106	30	67	37			1	38	04/09/98				BE - Cs-137
30-06-04	C-106	20	100	80			1	38	01/31/98				BE - Cs-137
30-06-09	C-106	25	80	55			1.5	50	01/29/98				BE - Cs-137
30-06-10	C-106	30	129	99			2	63	08/30/99				BE - Cs-137
30-06-12	C-106	15	99	84			1.5	50	01/22/98				BE - Cs-137
30-09-06	C-109	30	98	68			1.5	42	03/27/98				BE - Cs-137
40-02-03	S-102	20	80	60			1	39	05/18/97				
40-02-07	S-102	20	80	60			1	39	05/24/97				
40-02-08	S-102	20	80	60			1	39	09/21/00				
40-03-05	S-103	40	80	40			1	39	06/02/97				BE - Cs-137
40-04-05	S-104	35	100	65			1	49	09/18/00				Stability not determined
40-04-07	S-104	35	80	45			1	49	05/19/97				
40-04-08	S-104	20	50	30			1	49	05/19/97				
40-07-01	S-107	35	80	45			1	48	06/05/97				Assuming 40-04-05 is not stable
40-00-06	S-111	40	80	40			0	39	06/28/01				BE - Cs-137
40-11-01	S-111	40	80	40			0	39	06/26/01				
40-11-05	S-111	40	80	40			0	39	06/30/01				
40-11-07	S-111	35	80	45			0	39	06/22/01				BE - Cs-137
40-11-08	S-111	40	80	40			0	39	06/23/01				
40-11-09	S-111	40	80	40			0	39	07/04/01				
41-02-02	SX-102	25	140	115		L	2	84	03/06/02	09/07/01			Possible change; possible Sr-90
41-02-05	SX-102	40	80	40			0	34	04/05/00				BE - Cs-137
41-02-07	SX-102	40	80	40			0	34	04/01/00				BE - Cs-137
41-07-07	SX-107	40	75	26		S	2	54	03/25/02	09/26/01			No apparent change; requires HRLS
41-07-08	SX-107	40	76	46		L/M	2	54	03/16/02	09/17/01			Log with medium detector
41-08-03	SX-108	40	75	35			0.75	34	05/13/00				BE - Cs-137
41-00-08	SX-109	40	85	45		L	2	58	02/16/02	08/20/01			No apparent change
41-09-02	SX-109	40	74	34			1	33	06/03/96				
41-09-04	SX-109	40	102	62			2	58	03/08/00				Not logged due to borehole contamination
41-10-01	SX-110	40	80	40	10	L	2	54	03/12/02	09/13/01			No apparent change
41-11-10	SX-111	40	95	57		L/M/S	2	53	03/24/02	09/25/01			No apparent change; requires HRLS

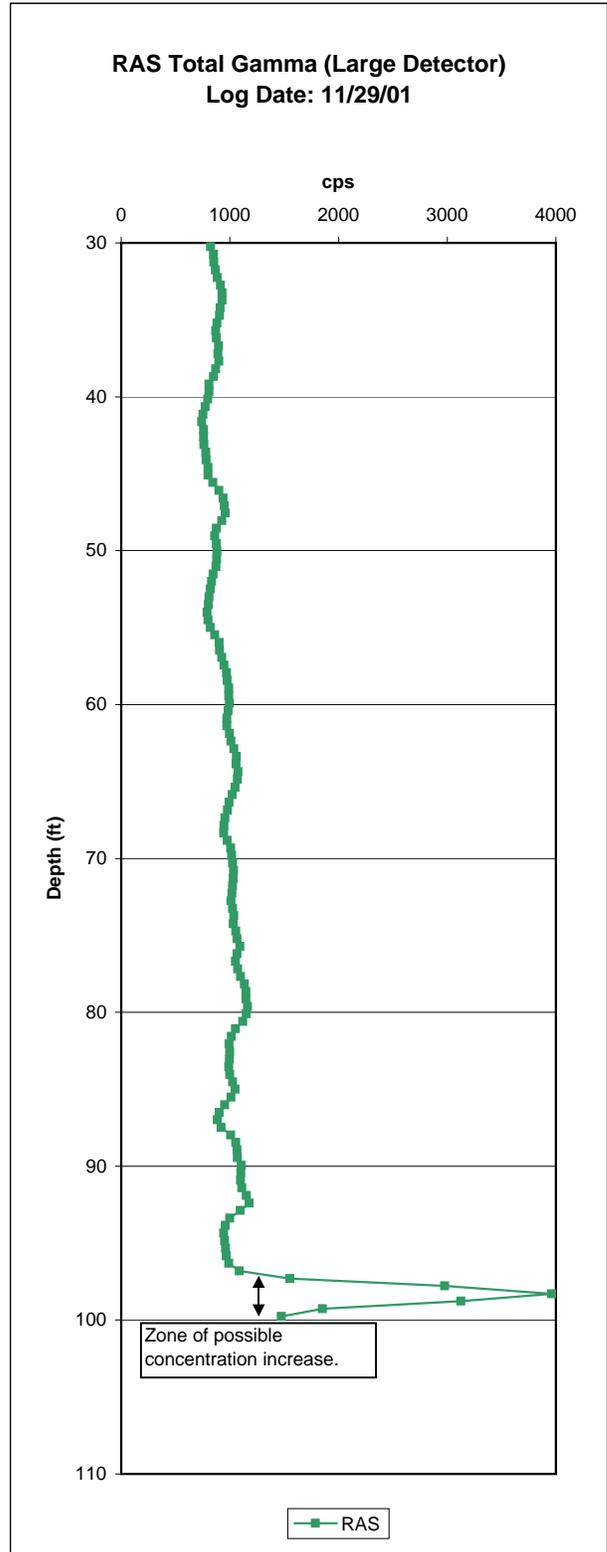
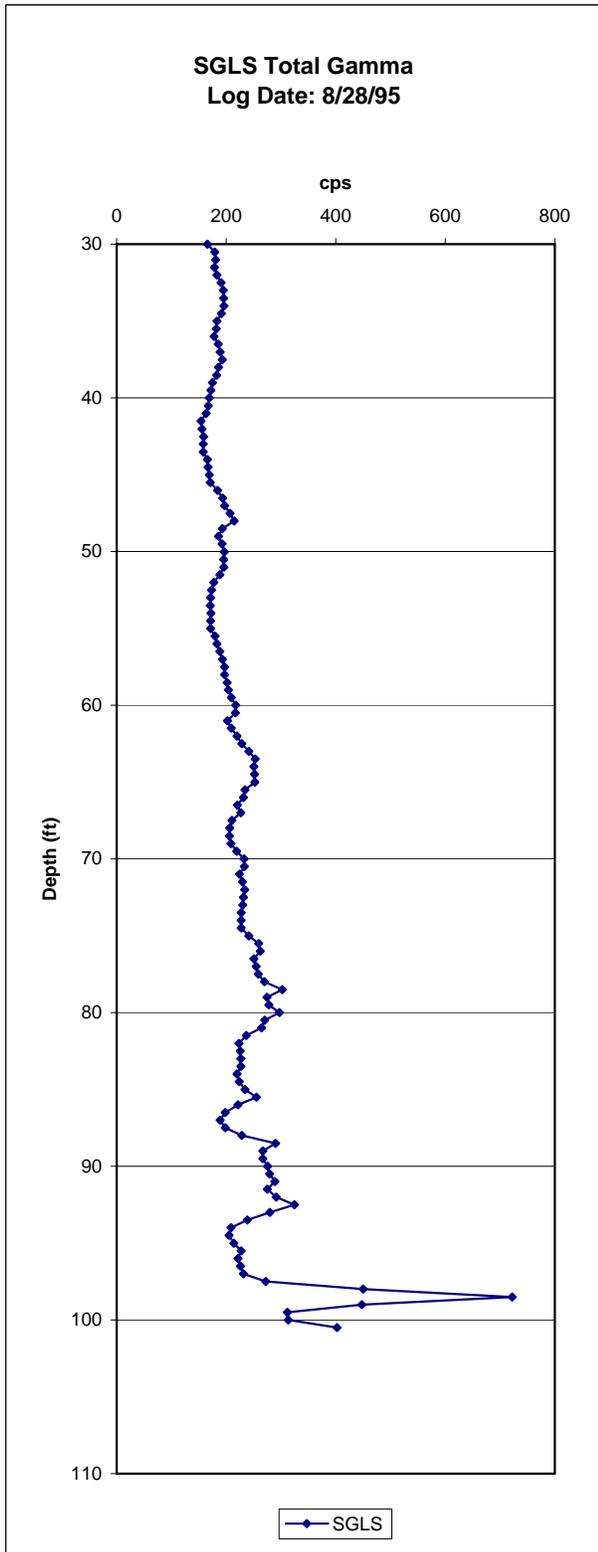
Table 4. Boreholes Projected for Logging During Second Quarter of FY 2002

Borehole Number	Tank	Top	Bottom	Footage	Rerun Footage	RAS Detector	Plume Score	Total Score	Next Log Date	RAS Event A	RAS Event B	RAS Event C	Comment
41-14-06	SX-114	30	76	46			1	31	07/11/96				
41-14-09	SX-114	40	75	35			1	31	07/13/96				BE - Cs-137
41-14-11	SX-114	40	75	35			1	31	07/13/96				BE - Cs-137
50-02-05	T-102	30	85	55		M	2	55	01/21/02	07/25/01			No apparent change
50-04-08	T-104	30	96	66	20	M	2	55	01/27/02	07/31/01			No apparent change
50-04-10	T-104	30	88	58		M	2	55	01/27/02	07/31/01			No apparent change
50-06-18	T-106	25	55	30		S	2	143	01/28/02	08/01/01			No apparent change
50-06-18	T-106	50	130	80		M	2	143	01/20/02	07/24/01			No apparent change
50-00-09	T-106	30	120	90	15	M	2	143	01/14/02	07/18/01			No apparent change
50-07-07	T-107	30	70	40			1	42	04/07/00				No log - water filled (06/18/01)
51-01-02	TX-101	40	80	40			1.5	41	01/24/00				
51-03-01	TX-103	40	80	40			1	30	12/22/96				BE - Cs-137
51-03-09	TX-103	40	100	60			2	55	07/26/99				
51-03-11	TX-103	40	100	60			1	30	12/14/96				
51-03-12	TX-103	40	100	60			1	30	12/16/96				BE - Cs-137; unstable
51-04-02	TX-104	40	80	40			1.5	42	01/22/00				Sb-125
51-04-05	TX-104	40	90	50			2	54	07/25/99				Unstable
51-04-06	TX-104	40	80	40			1.5	42	01/21/00				
51-05-01	TX-105	40	80	40			1	39	01/22/00				BE - Cs-137
51-05-03	TX-105	25	80	55			1.5	51	01/22/00				Possible Sr-90 at 32 ft
51-05-05	TX-105	40	80	40			2	64	07/28/99				Sb-125
51-05-07	TX-105	40	80	40			2	64	07/28/99				BE - Cs-137
51-05-08	TX-105	40	80	40			0.75	33	03/09/01				BE - Cs-137
51-14-04	TX-114	40	97	57			1	34	02/01/97				
51-14-08	TX-114	40	85	45			1	34	02/06/97				
51-14-11	TX-114	40	100	60			1	34	11/30/00				
51-16-04	TX-116	35	80	45			1	38	01/02/97				
52-03-03	TY-103	40	80	40			1	30	05/09/97				
52-03-06	TY-103	40	100	60			2	55	10/27/96				Unstable, 44-98 ft
52-03-12	TY-103	40	100	60			1	30	12/01/00				
52-05-07	TY-105	40	97	57			2	82	08/03/99				
52-06-04	TY-106	40	80	40			1.5	54	01/27/00				
52-06-05	TY-106	40	148	108			2	67	08/02/99				Unstable
52-06-06	TY-106	40	100	60			1.5	54	01/27/00				
52-06-07	TY-106	200	238	38			1	42	01/27/00				BE - Cs-137; Co-60 in groundwater
60-04-08	U-104	40	104	64		L	2	94	01/20/02	07/16/01	10/22/01		Apparent change 74-78 and 84-89 ft (SGLS); no change between RAS events
60-05-04	U-105	35	73	38		L	1.5	44	01/22/02	07/16/01	10/24/01		No apparent change
60-07-10	U-107	40	99	59		L	2	88	03/27/02	07/09/01	10/24/01	12/27/01	Apparent change (SGLS); 53-65 ft; no change between RAS events
60-07-11	U-107	40	100	60		L	2	88	03/27/02	07/12/01	10/24/01	12/27/01	Apparent change (SGLS) 73-95 ft; no change between RAS events
60-07-01	U-107	40	99	59	10	L	2	88	03/26/02	07/12/01	10/04/01	12/26/01	Apparent change (SGLS) 83-88 ft; no change between RAS events
60-07-02	U-107	35	100	65		L	0.75	56	03/26/02	07/12/01	10/04/01	12/26/01	No apparent change
60-08-04	U-108	35	100	65	10	L	1.5	57	03/28/02	07/09/01	10/25/01	12/28/01	No apparent change
60-10-01	U-110	35	75	40		L	0	11	03/27/02	07/17/01	10/04/01	12/27/01	No apparent change
60-10-11	U-110	35	75	40		L	0	11	01/02/02	07/17/01	10/04/01		No apparent change

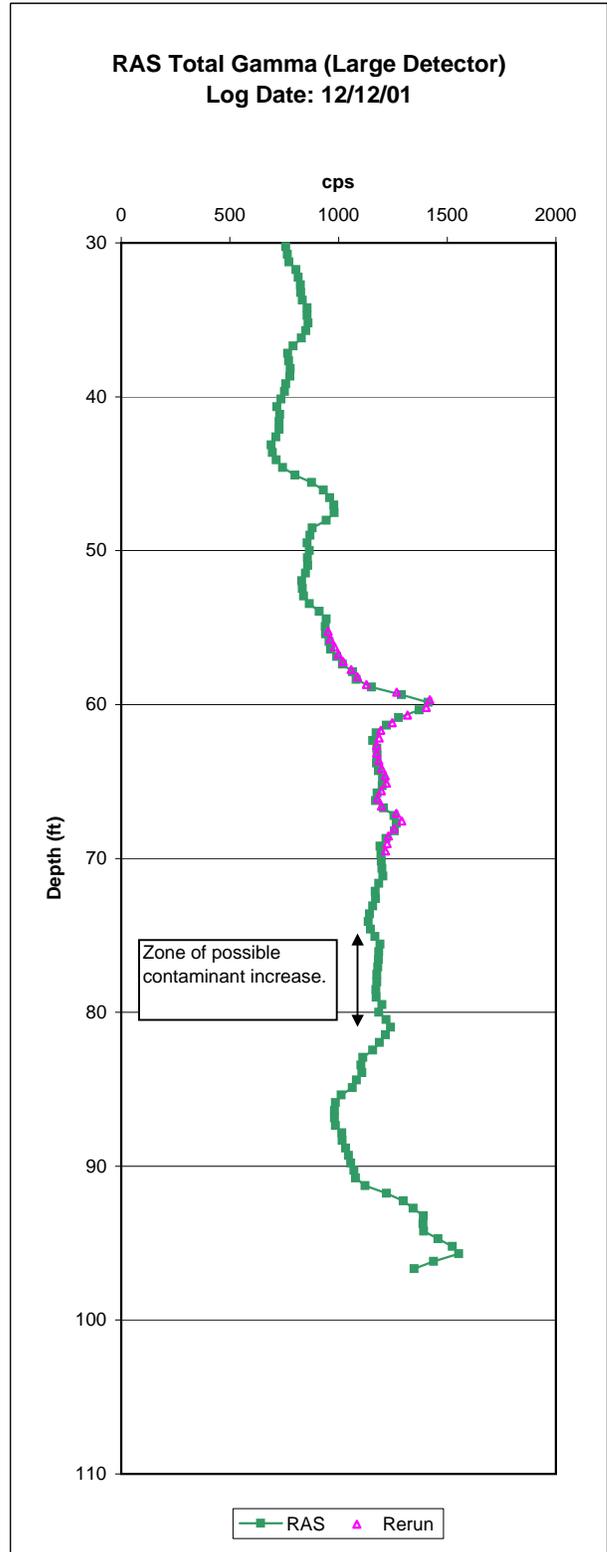
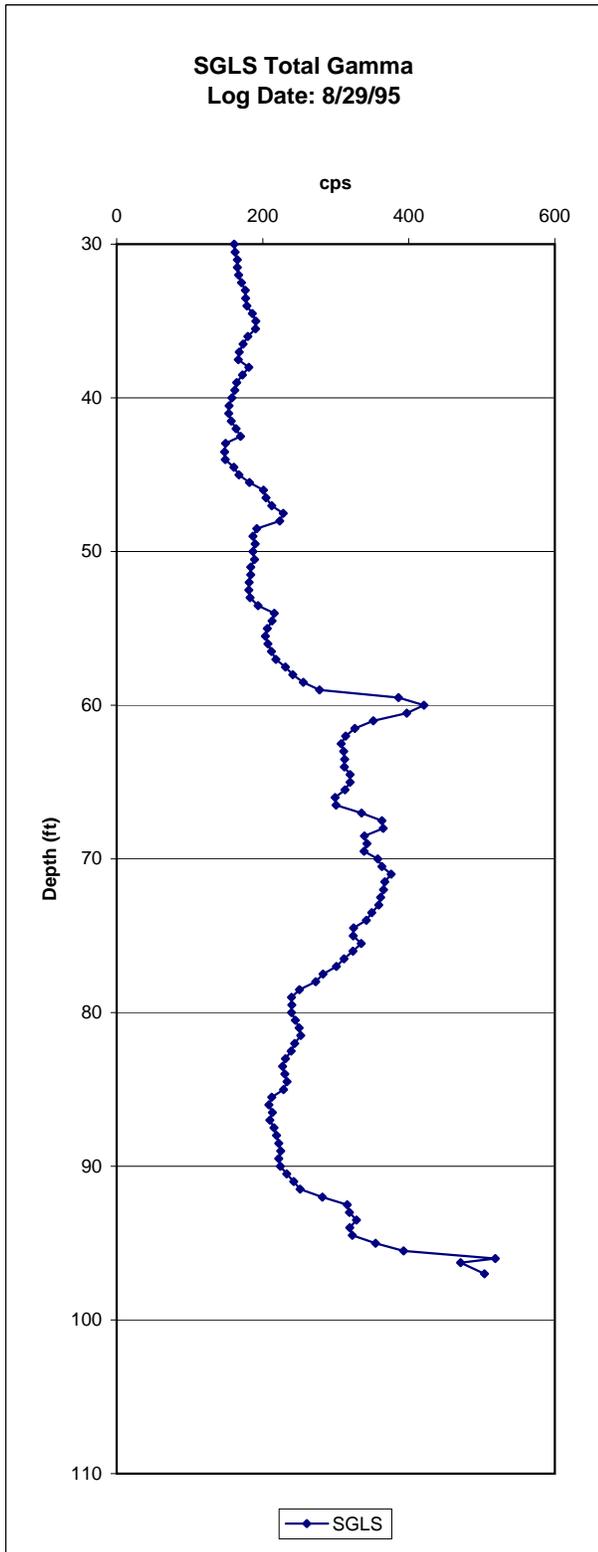
Borehole 22-03-04



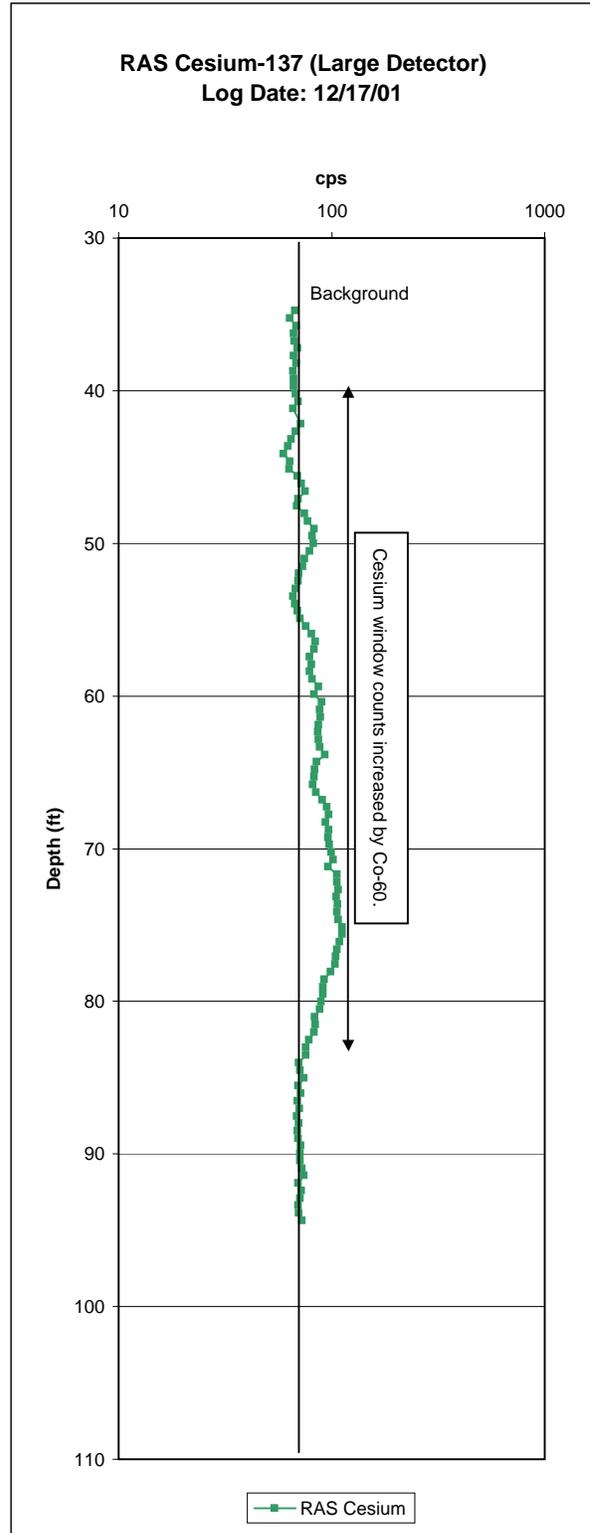
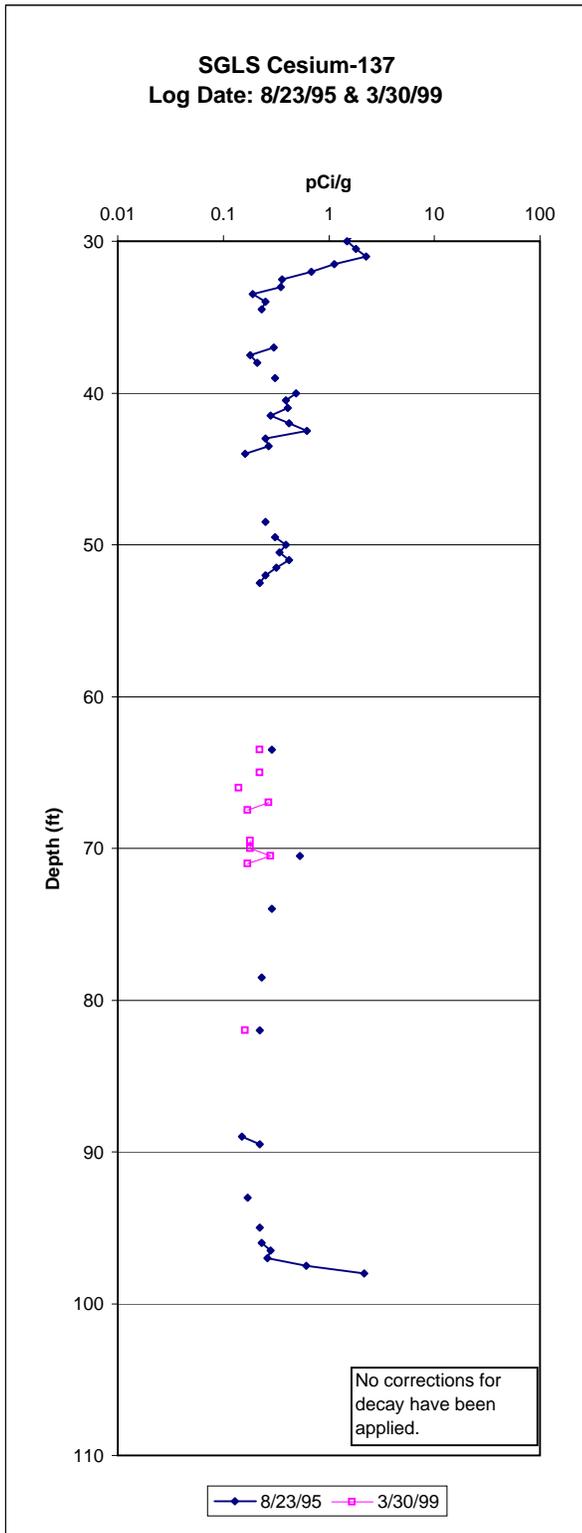
Borehole 22-07-02



Borehole 22-07-05



Borehole 22-08-05



Borehole 60-07-10

