



Borehole **51-18-05**

Log Event A

Borehole Information

Farm : <u>TX</u>	Tank : <u>TX-118</u>	Site Number : <u>299-W15-182</u>
N-Coord : <u>42,024</u>	W-Coord : <u>75,922</u>	TOC Elevation : <u>669.84</u>
Water Level, ft :	Date Drilled : <u>4/30/1974</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

This borehole was drilled in early April 1974 and was completed to 100 ft with 6-in. casing. The driller's log makes no reference to perforations or grout; therefore, it is assumed that the borehole was not perforated or grouted.

The casing thickness is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel casing.

The zero reference for the SGLS logs is the top of the casing. The top of the casing is approximately 2 in. above the surrounding ground surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>11/1995</u>	Calibration Reference : <u>GJPO-HAN-3</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>4/19/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>101.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>61.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>4/19/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>15.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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51-18-05

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Log Run Number :	<u>3</u>	Log Run Date :	<u>4/19/1996</u>	Logging Engineer:	<u>Kim Benham</u>
Start Depth, ft.:	<u>14.0</u>	Counting Time, sec.:		L/R :	Shield :
Finish Depth, ft. :		MSA Interval, ft. :		Log Speed, ft/min.:	
Log Run Number :	<u>4</u>	Log Run Date :	<u>4/22/1996</u>	Logging Engineer:	<u>Kim Benham</u>
Start Depth, ft.:	<u>100.5</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>68.5</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>
Log Run Number :	<u>5</u>	Log Run Date :	<u>4/23/1996</u>	Logging Engineer:	<u>Kim Benham</u>
Start Depth, ft.:	<u>69.5</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>14.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst : D.L. Parker

Data Processing Reference : P-GJPO-1787

Analysis Date : 1/23/1997

Analysis Notes :

The borehole was logged in five log runs with a centralizer used for each log run. Data from log runs 1 and 3 were not used in the analysis because of depth errors noted in the log data sheets. Log run 1 was discontinued when a "tool velocity" error message and erratic readings from the depth indicator were observed during the logging run. During log runs 2, 3, 4, and 5, line marks were checked against the depth indicator to ensure that accurate depth measurements were recorded. Log run 3 was discontinued when a depth error of 2.84 ft was noted. Accurate depth measurements were recorded during log runs 2, 4, and 5. Log runs 2, 4, and 5 were used for this analysis.

The pre- and post-survey field verification spectra for log runs 2 and 5 met the acceptance criteria established for the peak shape and system efficiency. The energy and peak-shape calibration from the post-survey field verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during log runs 2 and 5. The post-survey field verification spectra for log run 4 did not meet the established acceptance criteria; however, the pre-survey field verification spectra did meet the acceptance criteria. The energy and peak-shape calibration from the pre-survey field verification spectra were used to establish the channel-to-energy parameters used in the processing the spectra acquired during log run 4.

Casing correction factors for a 0.280-in.-thick casing were applied during the analysis.

Depth overlaps, where data were collected at the same depth during separate logging runs, occurred at a depth intervals from 14 to 15 ft and 68.5 to 69.5 ft. The concentrations of the naturally occurring radionuclides were calculated using the separate data sets at the overlapping depths. The calculated concentrations at the overlapping depths were within the statistical uncertainty of the measurements.

Cs-137 and Co-60 were the only man-made radionuclides encountered in this borehole. Cs-137



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contamination was detected continuously from the ground surface to about 50 ft and intermittently from 50 to 100.5 ft (the bottom of the borehole). Co-60 was detected only at a depth of 96 ft at a concentration of 0.09 pCi/g. The maximum Cs-137 concentration was 55 pCi/g at 3 ft.

The logs of the naturally occurring radionuclides show a pronounced increase in K-40 and U-238 concentrations at a depth of about 49 ft.

U-238 and Th-232 concentrations increase from 96 to 100.5 ft (the bottom of the borehole).

Details concerning the interpretation of data for this borehole are presented in the Tank Summary Data Report for tank TX-118.

Log Plot Notes:

Separate log plots show the man-made (Cs-137 and Co-60) and the naturally occurring radionuclides. The naturally occurring radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma-rays used to calculate concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection limit (MDL). The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes both the man-made and naturally occurring radionuclides, the total count log plot, as well as the Tank Farm gross-gamma log. The Tank Farm gross-gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma log plot to coincide with the SGLS data.