

# LA-UR-11-10383

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Title: Pu-238 Misreading at Buckman Well 1

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Intended for: DOE  
Meeting w/City of Santa Fe's Sangre de Cristo Water Division,  
2011-04-12 (Sante Fe, New Mexico, United States)  
Groundwater  
Reading Room  
None



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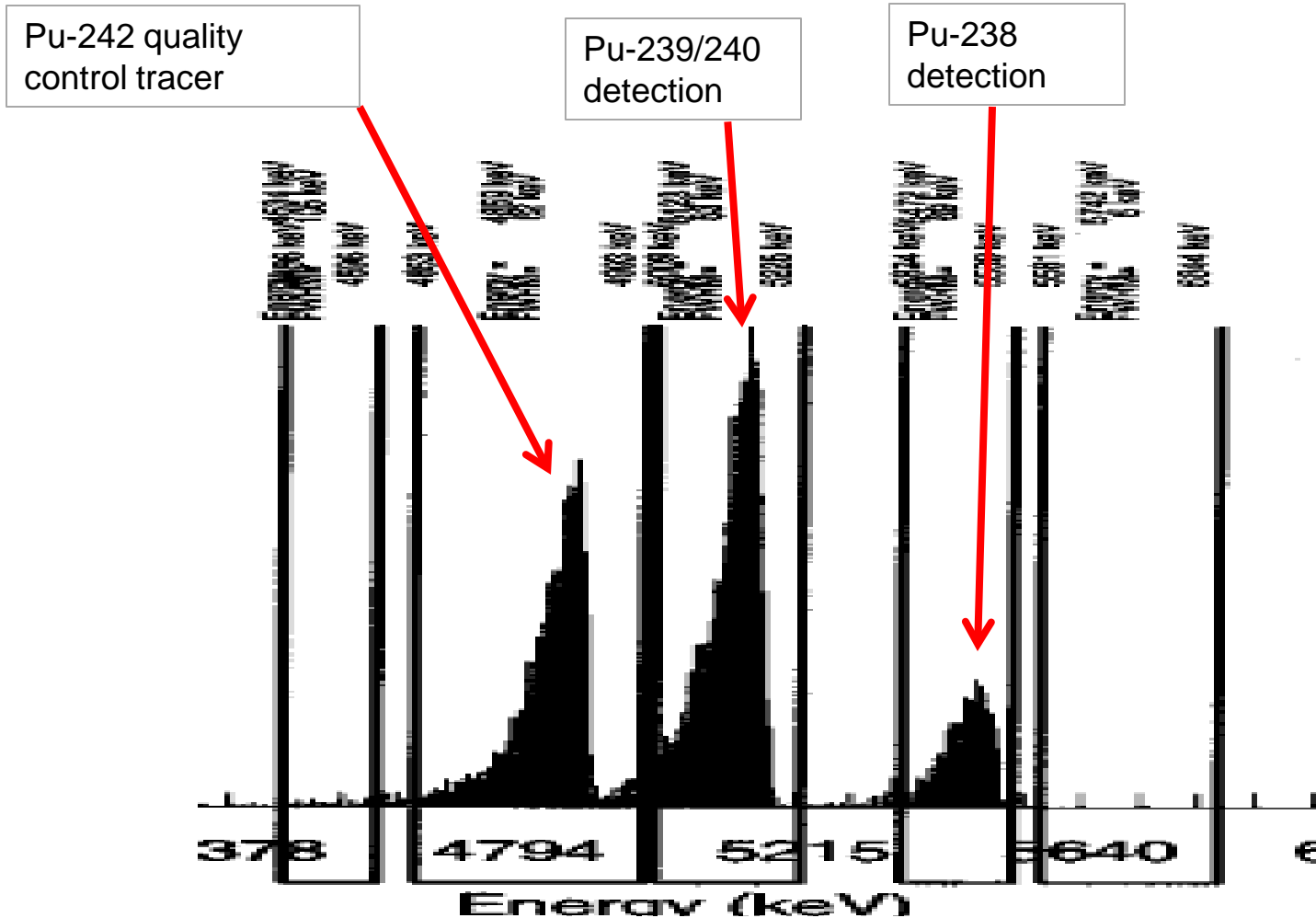
**Pu-238**

Correcting the misreading  
Buckman Well #1

# What is a spectrograph?



# Example of Detected Pu-238 by Alpha Spectroscopy



# History of the Sample

- On July 12, 2006, a water sample was collected at Buckman Well #1.
- GEL qualified Pu-238 as detected in the sample.
- After recent reviews, GEL now concludes this Pu-238 is NOT detected.
- Computer program for alpha spectroscopy did not evaluate the data properly.

# 2006 Radiochemistry Analysis Summary for Sample GU06077G1MB01 from GEL

		167110001 Ground Water GU060700G1MB01		Project: Client ID:		ESHL00701 ESHL001			
Collect Date:		12-JUL-06							
Receive Date:		14-JUL-06							
Collector:		Client							
Parameter	Qualifier	Result	DL	TPU	RL	Units	Analyst Date	DF	Time Batch Mtd.
<b>Rad Alpha Spec Analysis</b>									
<i>Alphaspec Am241 Liquid</i>									
Americium-241	U	0.00708	0.0234	+/-0.00484	0.050	pCi/L	JXG1	548788210807/27/06	1
<i>Alphaspec Pu, Liquid</i>									
Plutonium-238		0.0436	0.0349	+/-0.0193	0.050	pCi/L	JXG1	548789152407/31/06	2
Plutonium-239/240	U	-0.00363	0.0406	+/-0.0158	0.050	pCi/L			

# Pu Sample GU06077G1MB01 at Buckman Well #1

Alpha Spectroscopy Software Version 2.0  
software date: 12/06/1997

GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 548789  
SAMPLE DATE: 12-JUL-2006 00:00:00

SAMPLE ID: S0167110001\_PU  
SAMPLE QTY: 0.800 L

DETECTOR NUMBER : 30449  
AVERAGE %EFFICIENCY : 29.6162  
% YIELD : 52.427

COUNT DATE: 31-JUL-2006 15:24:08  
ELAPSED LIVE TIME (SEC): 60000.00  
ANALYST : JXG1

MS : 0338-R  
MSD : 0338-R  
LCS : 0338-R  
TRACER : 0938-A  
BKG FILE: B047.CNF.717  
BKG DATE: 30-JUL-2006

MS PC/I/L : 3.145498  
MSD PC/I/L : 3.145498  
LCS PC/I/L : 3.145498  
TRACER DPM : 8.3339  
EFF FILE : W047.CNF.181  
CAL DATE: 3-JUL-2006

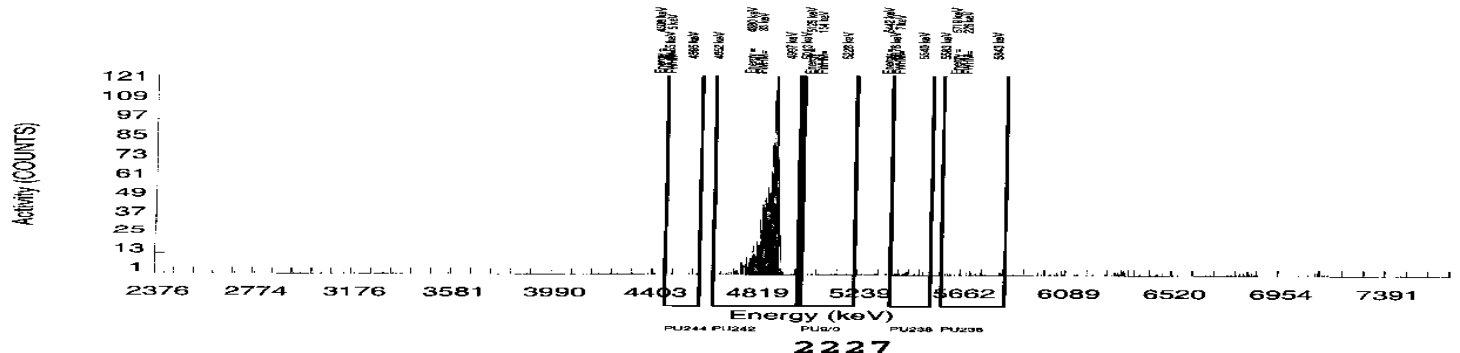
MS ISOTOPE : PU-9/0  
MSD ISOTOPE : PU-9/0  
LCS ISOTOPE : PU-9/0  
TRACER ISOTOPE : PU242  
LIB FILE : ENV\_ALPHA\_PU.N

### NUCLIDE ACTIVITY SUMMARY

See blank population

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1-SIGMA	DLC pCi/L	MDC pCi/L	UNC pCi/L
PU-9/0	5155.000	-1.000 ✓	10.000	99.90000	-3.63E-03	1.58E-02	2.67E-02	6.32E-02	1.58E-02
PU-236	5749.000	1.000	25.000	100.00000	3.67E-03	2.62E-02	4.27E-02	9.54E-02	2.62E-02
PU-238	5499.000	12.000	8.000	99.90000	4.36E-02	1.93E-02	2.39E-02	5.76E-02	1.92E-02
PU242	4890.000	1294.000	16.000	100.00000	4.69E+00	2.29E-01	3.37E-02	7.73E-02	1.32E-01
PU-244	4589.000	2.000	4.000	99.90000	7.26E-03	1.15E-02	1.69E-02	4.36E-02	1.15E-02

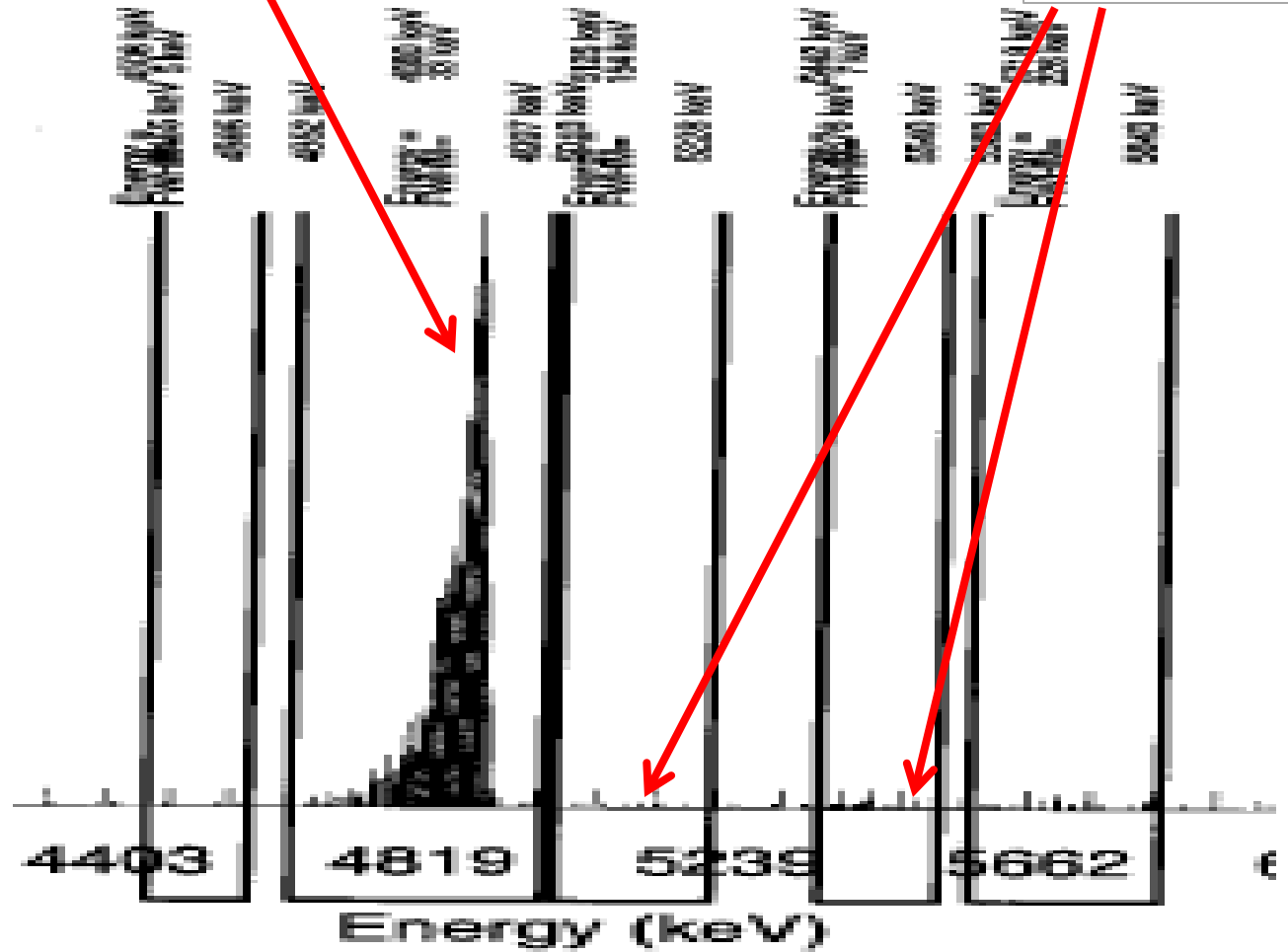
*pph 8/2/06*



# A closer view

Pu-242 quality control tracer

No peaks for Pu-239/240, No peak for Pu-238



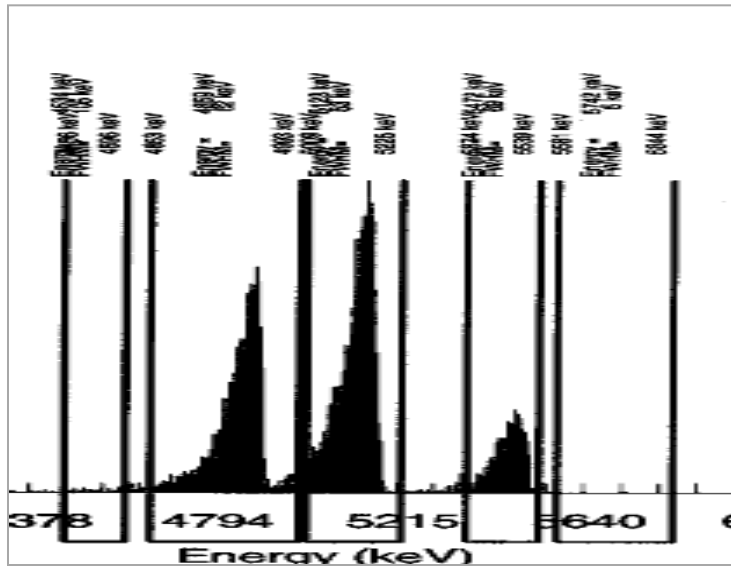


# How to read the graph

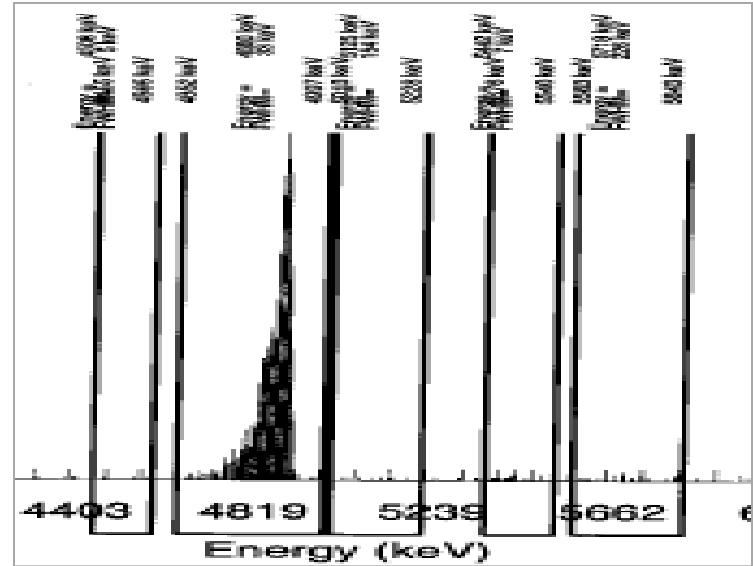
- First peak is quality control Tracer Pu-242.
- No peak is observed for Pu-239/240.
- No peak at correct location for Pu-238.
  - GEL Labs concluded Pu-238 is NOT present in this sample.

# Side by side comparison

Example showing actual detection



Buckman Well sample



# Results

- The results have been formally updated and flagged “not detected” in the RACER database.