4B113

MEMORANDUM

lot 24

TO Steve Singer, Groundwater Lead, EOM, Bldg 080, X8635

FROM Mark Wood, Operable Unit 6 Closure, Bldg 080, X8784
MRW

DATE July 6, 1994

000064233

SUBJECT Operable Unit 6 Groundwater Monitoring Requirements

This memorandum is intended to notify you that the existing groundwater monitoring program for CERCLA wells located in or adjacent to Operable Unit (OU) 6 has been completed as of the second quarter of 1994, pursuant to the Groundwater Sample Request Form dated December 3, 1993 The OU6 project management requests that the sampling frequency and target analyte suite be reevaluated inconjunction with sitewide groundwater monitoring requirements If you have any questions please call me or Neil Holsteen at X6987, thank you

cc N Holsteen
E Mast
L Klotz

1/24

Best Available Copy

ADMIN RECORD
A-OU06-000558

MEMO 2

TO Bob Hencmann

FROM Leon Klotz

DATE 5-27-93

SUBJECT OU6 Sampling

Bob , this is to verify that OU6 wells will be sampled only once a quarter This superceeds an earlier request of sampling (2) times quarterly

Also, I gave you an analyte list updated that will be used for all OU6 wells The reference no is 13

Included on this list are added wells 41091, B206389, B206489, 7287, B206789 They have been sampled this quarter using the analyte (3) list If there are analytes on the ref 13 list that were not included on the (3) list, repurge the well and sample for those analytes only

CC Pete Lauren
Neil Holstein

2

MEMO

3

DATE December 2, 1993

TO Leon Klotz, Geosciences

FROM Neil Holsteen, RPM NJH

SUBJECT SAMPLING AT OU5 AND OU6 WELLS

OU6

The attached Groundwater Sample Request Form will supersede Request Number 14 for OU6 wells The analytes have not changed from the previous Request The purpose of Request No 15 is to extend the time frame for sampling these wells The OU6 wells need to continue to be sampled through the second quarter of 1994 in order to ensure completeness It will be necessary to continue to collect a filtered and unfiltered water quality sample at well numbers 75092, 75292, and 41091

OU5

The OU5 groundwater monitoring wells will continue to be sampled for the same analytes until the end of the second quarter of 1994

If you have any questions please Neil Holsteen at x6987

cc Ed Mast, OU5, OU6 Project Manager

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Groundwater Sample Request Form

EG&G Rocky Flats, ES&E Geosciences Division

Page 1 of 2

Request Number 15

Requestor: ~~Pete Laurin~~ Ed Mast

Organization: RPM

Date: 12-3-93

Project: OU6

Charge Number:

Purpose: RFI/RI Sample each well for a total of 6 quarters

This request supercedes request #14

Legend

[1] Frequency: W = Weekly, M = Monthly, Q = Quarterly, B = Biannual, A = Annually, O = Other

[2] Split Code Shown for Total (Blank) Dissolved (*) Per Requestor Specifications

[3] May Require Modification for Partial Samples or Specific Lab Requirements

Parameter	VOA – CLP	VOA – 524.2	BNA – CLP	PCBs/Pest–CLP	CLP Metals (S+A)	Water Quality	NO_3/NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{234,235,238}U$	$^{239,240}Pu$ ^{241}Am	^{137}Cs ^{90}Sr ^{226}Ra	Tritium	Rac Screen	[illegible]	[illegible]
Bottle Codes[2,3]	V	V C	B A R	P	M *	W A A	W B C	W B A	W D A	W E	W G	W H	R A *	R C *	R B *	R P *	R G	R H	B	W B K
Container Type[3]	40 ml Amber	40 ml Amber	1L Amber	1L Amber	1L Poly	1L Poly	250 ml Poly	1L Poly	250 ml Poly	1L Poly	125 ml Poly	125 ml Poly	500 ml Poly	1L Poly	1 Gallon Poly	Gallon Poly	100 ml Glass	100 ml Poly		
No of Containers[2,3]	2	2	1	1	1/1	1	1	1	1	1	1	1	1/1	1/1	2/2	1/1	1	1		
Preservative: Cool to 4°C	*	*	*	*	*	*	*	*	*	*	*	*								
Preservative: NaOH										*										
Preservative: HNO_3					*								*	*	*	*				
Preservative: H_2SO_4							*	*			*	*								
Total	*	*	*	*	X	*	*	*		*	*	*	X	X	Y	X	X	*	X	
Dissolved									*											
Analyte Group No (See Instructions)																				
Comments																				

Well Number	Start/End Date		Sampling Frequency[1]	Water Level Frequency[1]	Previous Request Number
75992			1x qtr		1&4
75092					
75292					
77492					
75892					
76192					
76292					
76992					
77392					
76792					
71192					
41091					
B206389					
B206489					
7287					
B206789					

Form 01/10/93

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Groundwater Sample Request Form

EG&G Rocky Flats, ES&E Geosciences Division

Page 2 of 2

Request Number 15

Requestor: ~~Pete Laurin~~ Ed Mast

Organization: RPM

Date: 12-3-93

Project: OU6

Charge Number:

Purpose: RFI/RI

This supercedes request 7714

Sample each for a total of ~~4~~ 6 quarters. Only dissolved analytes on this form

Legend

[1] Frequency

[2] Split Code Shown for Total (Blank)/ Dissolved (*) Per Requestor Specifications

[3] May Require Modification for Partial Samples or Specific Lab Requirements

W = Weekly
M = Monthly
Q = Quarterly
B = Biannual
A = Annually
O = Other

Bottle Codes[2,3]	V	V	B	P	M	W	W	W	W	W	W	W	R	R	R	R	R	R			
		C	A		/ *	A	B	B	D	E	G	H	A	C	B	P	G	H			
		C	R			A	C	A	A				/ *	/ *	/ *	/ *					
Container Type[1]	40 ml Amber	40 ml Amber	1L Amber	1L Amber	1L Poly	1L Poly	250 ml Poly	1L Poly	250 ml Poly	1L Poly	125 ml Poly	125 ml Poly	500 ml Poly	1L Poly	1 Gallon Poly	1 Gallon Poly	100 ml Glass	100 ml Poly			
No of Containers[2,3]	2	2	1	1	1/1	1	1	1	1	1	1	1	1/1	1/1	2/2	1/1	1	1			
Preservative: Cool to 4°C	*	*	*	*	*	*	*	*	*	*	*	*									
Preservative: NaOH										*											
Preservative: HNO_3					*								*	*	*	*					
Preservative: H_2SO_4							*	*			*	*									
Preservative:																					
Total	*	*	*	*		*	*	*		*	*	*						*			
Dissolved					X				*					X	X	X					
Analyte Group No (See Instructions) / Parameter	VOA – CLP	VOA – 524.2	BNA – CLP	PCBs/Pes.–CLP	CLP Metals (S+A)	Water Quality	NO_3/NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233,234}U$, ^{235}U, ^{238}U	$^{239,240}Pu$, ^{241}Am	^{137}Cs, $^{89,90}Sr$, ^{226}Ra, ^{228}Ra	Tritium	Rad Screen			

Well Number	Start/End Date		Sampling Frequency[1]	Water Level Frequency[1]	Previous Request Number	Comments	VOA – CLP	VOA – 524.2	BNA – CLP	PCBs/Pes.–CLP	CLP Metals (S+A)	Water Quality	NO_3/NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233,234}U$, ^{235}U, ^{238}U	$^{239,240}Pu$, ^{241}Am	^{137}Cs, $^{89,90}Sr$, ^{226}Ra, ^{228}Ra	Tritium	Rad Screen
75092			1xqtr		14						X	X								X	X	X		
75292											X	X								X	X	X		
41091											X	X								X	X	X		
75892											X									X	X			
76792																				X	X			
77192																				X	X			
B206789																				X	X			

Form 01/19 93

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Groundwater Sample Request Form

EG&G Rocky Flats, ES&E Geosciences Division

Page 1 of 2

Request Number 13

Requestor: Pete Laurin

Organization: RPM

Date: 5-25-93

Project: OU6

Charge Number:

Purpose: RFI/RI Sample each well for a total of 4 quarters

This request supercedes request #12

Legend

[1] Frequency

[2] Split Code Shown for Total (Blank)/ Dissolved (*) Per Requestor Specifications

[3] May Require Modification for Partial Samples or Specific Lab Requirements

W = Weekly
M = Monthly
Q = Quarterly
B = Biannual
A = Annually
O = Other

Well Number	Start/End Date	Sampling Frequency[1]	Water Level Frequency[1]	Previous Request Number	Comments	Analyte Group No (See Instructions)	VOA – CLP	VOA – 524 2	BNA – CLP	PCBs/Pest–CLP	CLP Metals (S+A)	Water Quality	NO_3 /NO_2 as ~~N~~ Nitrate	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233/234}U$, ^{235}U, ^{238}U	$^{239/240}Pu$, ^{241}Am	^{137}Cs, $^{89/90}Sr$, ^{226}Ra, ^{228}Ra	Tritium	Rad Screen	~~TCL Semivolatiles~~	~~Nitrate~~
						Bottle Codes[2 3]	V	V	B	P	M	W	W	W	W	W	W	W	R	R	R	R	R	R	B	W
								C	A		/ *	A	B	B	D	E	G	H	A	C	B	P	G	H		B
								C	R			A	C	A	A				/ *	/ *	/ *	/ *				K
						Container Type[3]	40 ml Amber	40 ml Amber	1L Amber	1L Amber	1L Poly	1L Poly	250 ml Poly	1L Poly	250 ml Poly	1L Poly	125 ml Poly	125 ml Poly	500 ml Poly	1L Poly	1 Gallon Poly	1 Gallon Poly	100 ml Glass	100 ml Poly		
						No of Containers[2 3]	2	2	1	1	1/1	1	1	1	1	1	1	1	1/1	1/1	2/2	1/1	1	1		
						Preservative: Cool to 4°C	*	*	*	*	*	*	*	*	*	*	*	*								
						Preservative: NaOH										*										
						Preservative: HNO_3					*								*	*	*	*				
						Preservative: H_2SO_4							*	*			*	*								
						Preservative:																				
						Total	*	*	*	*	X	*	*	*		*	*	*	X	X	X	X	X	*	X	
						Dissolved									*											
75992		1x Qtr		12			X		X		X								X	X	X			X		
75092							X		X		X		X						X	X	X	X	X	X		
75292							X		X		X		X						X	X	X	X	X	X		
77492							X		X	X	X		X					X	X	X	X		X	X		
75892											X								X	X	X			X		
76192							X		X	X	X								X					X		
76292							X		X	X	X								X					X		
76992							X		X	X	X								X					X		
77392							X		X	X	X								X					X		
76792							X			X	X		X								X		X	X		
77192							X			X	X		X								X		X	X		
41091							X		X		X		X						X	X	X	X	X	X		
B206389							X		X	X	X								X					X		
B206489							X		X	X	X								X					X		
7287							X		X	X	X								X					X		
B206789							X			X	X		X								X		X	X		

Form 01/18 93

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Groundwater Sample Request Form

EG&G Rocky Flats, ES&E Geosciences Division

Page 2 of 2

Request Number 13

Requestor: Pete Laurin

Organization: RPM

Date: 5-25-93

Project: OU6

Charge Number:

Purpose: RFI/RI

This supercedes request #12

Sample each for a total of 4 quarters Only Dissolved analytes on this form

Legend

[1] Frequency

[2] Split Code Shown for Total (Blank)/ Dissolved (*) Per Requestor Specifications

[3] May Require Modification for Partial Samples or Specific Lab Requirements

W = Weekly
M = Monthly
Q = Quarterly
B = Biannual
A = Annually
O = Other

Analyte Group No (See Instructions)	VOA – CLP	VOA – 524.2	BNA – CLP	PCBs/Pest–CLP	CLP Metals (S+A)	Water Quality	NO_3 /NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233/234}U$, ^{235}U, ^{238}U	$^{239/240}Pu$, ^{241}Am	^{137}Cs, $^{89/90}Sr$, ^{226}Ra, ^{228}Ra	Tritium	Rad Screen
Bottle Codes[2 3]	V	V	B	P	M	W	W	W	W	W	W	W	R	R	R	R	R	R
		C	A		*	A	B	B	D	E	G	H	A	C	B	P	G	H
		C	R			A	C	A	A				*	*	*	*		
Container Type[3]	40 ml Amber	40 ml Amber	1L Amber	1L Amber	1L Poly	1L Poly	250 ml Poly	1L Poly	250 ml Poly	1L Poly	125 ml Poly	125 ml Poly	500 ml Poly	1L Poly	1 Gallon Poly	1 Gallon Poly	100 ml Glass	100 ml Poly
No of Containers[2 3]	2	2	1	1	1/1	1	1	1	1	1	1	1	1/1	1/1	2/2	1/1	1	1
Preservative: Cool to 4°C	*	*	*	*	*	*	*	*	*	*	*	*						
Preservative: NaOH										*								
Preservative: HNO_3					*								*	*	*	*		
Preservative: H_2SO_4							*	*			*	*						
Preservative:																		
Total	*	*	*	*		*	*	*		*	*	*						*
Dissolved					X				*					X	X	X		

Well Number	Start/End Date		Sampling Frequency[1]	Water Level Frequency[1]	Previous Request Number	Comments	VOA – CLP	VOA – 524.2	BNA – CLP	PCBs/Pest–CLP	CLP Metals (S+A)	Water Quality	NO_3 /NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233/234}U$, ^{235}U, ^{238}U	$^{239/240}Pu$, ^{241}Am	^{137}Cs, $^{89/90}Sr$, ^{226}Ra, ^{228}Ra	Tritium	Rad Screen
75092			1xqtr		12						X	X								X	X	X		
75292			↓		↓						X	X								X	X	X		
41091											X	X								X	X	X		
75892											X									X	X			
76792																				X	X			
77192																				X	X			
B206789			✓		✓															X	X			

Form 01/19/93

Groundwater Sample Request Form

EG&G Rocky Flats, ES&E Geosciences Division

Page 1 of 2

Request Number 12

Requestor: Pete Laurin

Organization: RPM

Date: 3/30/93

Project: 0116

Charge Number:

Purpose: RFI/RI

Legend

[1] Frequency

[2] Split Code Shown for Total (Blank)/ Dissolved (*) Per Requestor Specifications

[3] May Require Modification for Partial Samples or Specific Lab Requirements

W = Weekly
M = Monthly
Q = Quarterly
B = Biannual
A = Annually
O = Other

Well Number	Start/End Date (Sample 2x QTT for 3 Sampling Events)	Sampling Frequency[1]	Water Level Frequency[1]	Previous Request Number	Comments
75992	4/1/93	2 QTT			Sample 2x 2nd
75292					Quarter -
75092					Once at the
77492					beginning
75892					and once at
76192					the end.
76292					
76992					
77392					
76792					
77192					

Bottle Codes[2,3]	V	V	B	P	M	W	W	W	W	W	W	W	R	R	R	R	R	R	B	W
		C	A		*	A	B	B	D	E	G	H	A	C	B	P	G	H		B
		C	R			A	C	A	A				*	*	*	*				K
Container Type[3]	40 ml Amber	40 ml Amber	1L Amber	1L Amber	1L Poly	1L Poly	250 ml Poly	1L Poly	250 ml Poly	1L Poly	125 ml Ploy	125 ml Poly	500 ml Poly	1L Poly	1 Gallon Poly	1 Gallon Poly	100 ml Glass	100 ml Poly		
No of Containers[2,3]	2	2	1	1	1/1	1	1	1	1	1	1	1	1/1	1/1	2/2	1/1	1	1		
Preservative: Cool to 4°C	*	*	*	*	*	*	*	*	*	*	*	*								
Preservative: NaOH										*										
Preservative: HNO_3					*								*	*	*	*				
Preservative: H_2SO_4							*	*			*	*								
Total	*	*	*	*	X	*	*	*		*	*	*	X	X	X	X	X	*		
Dissolved									*											
Parameter / Analyte Group No (See Instructions)	VOA – CLP	VOA – 524.2	~~BNA – CLP~~	PCBs/Pest–CLP	CLP Metals (S+A)	Water Quality, TAS	NO_3 /NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233/234}U$, ^{235}U, ^{238}U	$^{239/240}Pu$, ^{241}Am	^{137}Cs, $^{89/90}Sr$, ^{226}Ra, ^{228}Ra	Tritium	Rad Screen	TCL Semiv.	Nitrate
75992	X			X	X								X	X	X			X	X	X
75292	X		X		X	X	X	X					X	X	X	X	X	X	X	X
75092	X		X		X	X	X	X					X	X	X	X	X	X	X	X
77492	X		X	X			X	X				X	X	X	X			X		
75892					X	X							X	X	X			X		
76192	X		X	X	X								X					X		
76292	X		X	X	X								X					X		
76992	X		X	X	X								X					X		
77392	X		X	X	X								X					X		
76792	X		X	X	X		X	X							X			X		
77192	X		X	X	X		X	X							X			X		

Normal Sampling Sequence. Collect Filtered Pans lowest Priority

Form 01/18/93

Groundwater Sample Request Form

EG&G Rocky Flats, ES&E Geosciences Division

Page 2 of 2

Request Number 12

Requestor: Pete Lauritzen

Organization: RPM

Date: 3/29/93

Project: 046

Charge Number:

Purpose: 046

Legend

[1] Frequency
[2] Split Code Shown for Total (Blank)/ Dissolved (*) Per Requestor Specifications
[3] May Require Modification for Partial Samples or Specific Lab Requirements

W = Weekly
M = Monthly
Q = Quarterly
B = Biannual
A = Annually
O = Other

Analyte Group No (See Instructions)	VOA – CLP	VOA – 524.2	BNA – CLP	PCBs/Pest–CLP	CLP Metals (S+A)	Water Quality	NO_3 /NO_2 as N	Ammonia (NH_3)	Ortho – Phosphate	Cyanide	COD	TOC	Gross Alpha/Beta	$^{233/234}U$, ^{235}U, ^{238}U	$^{239/240}Pu$, ^{241}Am	^{137}Cs, $^{89/90}Sr$ ^{226}Ra, ^{228}Ra	Tritium	Rad Screen
Bottle Codes[2,3]	V	V	B	P	M	W	W	W	W	W	W	W	R	R	R	R	R	R
		C	A		/*	A	B	B	D	E	G	H	A	C	B	P	G	H
		C	R			A	C	A	A				/*	/*	/*	/*		
Container Type[3]	40 ml Amber	40 ml Amber	1L Amber	1L Amber	1L Poly	1L Poly	250 ml Poly	1L Poly	250 ml Poly	1L Poly	125 ml Poly	125 ml Poly	500 ml Poly	1L Poly	1 Gallon Poly	1 Gallon Poly	100 ml Glass	100 ml Poly
No of Containers[2,3]	2	2	1	1	1/1	1	1	1	1	1	1	1	1/1	1/1	2/2	1/1	1	1
Preservative: Cool to 4°C	*	*	*	*	*	*	*	*	*	*	*	*						
Preservative: NaOH										*								
Preservative: HNO_3					*								*	*	*	*		
Preservative: H_2SO_4							*	*			*	*						
Total	*	*	*	*		*	*	*		*	*	*						*
Dissolved									*					X	X	X		

Well Number	Start/End Date		Sampling Frequency[1]	Water Level Frequency[1]	Previous Request Number	Comments
75292						Filtered
7·092						Rads To
75892						be included
76192						on Page 1
77192						

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MONITORING WELL STATUS

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	Quarter 2 - 1993			
Well I D	Date	Sampled	Sample Number	Comments
75092		no		Turbidity did not stabilize during purge
75292	1/20/93	no	GW00190WC	Not Developed-Dry
75892	1/20/93	no	GW00191WC	Not Developed-Dry
75992		no		Not Developed-Dry
76192	1/20/93	no	GW00192WC	Not Developed-Dry
76292	3/23/93	yes	GW00467WC	Incomplete suite of samples
76792	1/14/93	no	GW00085WC	Not Developed-Dry
76992	1/14/93	no	GW00086WC	Not Developed-Dry
77192	1/20/93	no	GW00193WC	Not Developed-Dry
77392	1/20/93	no	GW00194WC	Not Developed-Dry
77492	3/20/93	yes	GW00469WC	
41091	2/18/93	yes	GW00125WC	Incomplete suite of samples
B206389	2/9/93	yes	GW00115WC	Incomplete suite of samples
B206489	2/2/93	yes	GW00116WC	
7287	2/1/93	yes	GW00113WC	
B206789	2/7/93	yes	GW00120WC	Incomplete suite of samples

	Quarter 3 - 1993			
Well I D.	Date	Sampled	Sample Number	Comments
75092	4/22/93	yes	GW00657WC	Incomplete suite of samples
75292	4/23/93	yes	GW00658WC	Incomplete suite of samples
75892	4/1/93	no	GW00567WC	Not Developed-Dry
75992		no		Not Developed
76192		no		Not Visited
76292	4/21/93	yes	GW00533WC	
76792	4/1/93	no	GW00595WC	Dry
76992	4/1/93	no	GW00596WC	Dry
77192		no		Not Visited
77392		no		Not Visited
77492	4/21/93	yes	GW00534WC	
41091				Not Visited
B206389	4/13/93	yes	GW00521WC	Incomplete suite of samples
B206489	4/9/93	yes	GW00522WC	
7287				
B206789	4/13/93	yes	GW00526WC	Incomplete suite of samples

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EG&G ROCKY FLATS

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INTEROFFICE CORRESPONDENCE

DATE March 10, 1994

TO Distribution

FROM S H Singer, Geosciences, Bldg 080, X8635 SHS

SUBJECT STATUS OF EVALUATION ON WELL 41691 - SHS-005-94

This memo will serve as a status report on activities conducted to analyze the nature of plutonium anomalies in Well 41691 at the east boundary of Rocky Flats Plant (RFP) since the last meeting on January 18, 1994

1 Update to groundwater geochemical analyses Since the meeting, three more results for water quality have been received These values represent results from the second, third and fourth quarters of FY93 The table below shows Plutonium 139/240 values, in pCI/l since sampling was commenced on Well 41691

Sample Date	PU	Error	Valid	AM	Error	Valid	Filtration
12/07/91	2 204	313	A	47	086	A	Unfiltered
04/01/92	1 296	182	A	22	05	A	Unfiltered
04/01/92	003	005	A	034	011	A	Filtered
06/11/92	3927	0691	R	092	025	R	Unfiltered
09/16/92	6774	134	A	080	023	A	Unfiltered
11/18/92	34	056	A	023	003	A	Unfiltered
03/17/93	- 007	18	R	3 2	057	A	Unfiltered
06/22/93	56	086	V	086	030	V	Unfiltered
09/20/93	37	034	Y	12	022	Y	Unfiltered
12/09/93	258	032	Y	05	012	Y	Unfiltered
12/09/93	001	003	Y	007	006	Y	Filtered

2 Redevelopment activities Well 41691 was scheduled for redevelopment activities in February and early March This activity involved attempts to clean up the sediment in the well by using surge blocks to remove sediment from the well screen and well bore Redevelopments were conducted on February 16, February 18, February 25 and March 4, 1994 In addition to development the wells were purged and sampled for both filtered and unfiltered Plutonium/Americium and sent to the laboratory for quick turnaround analysis

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Sample No	Sample Date	PU	Error	Valid	Filtration
GW00247GA	02/16/94	0	0	Y	Filtered
GW00247GA	02/16/94	094	030	Y	Unfiltered
GW00248GA	02/16/94	0	0	Y	Filtered
GW00248GA	02/16/94	99	18	Y	Unfiltered
GW00274GA	02/18/94	002	003	Y	Filtered
GW00274GA	02/18/94	595	075	Y	Unfiltered
GW00275GA	02/18/94	003	004	Y	Filtered
GW00275GA	02/18/94	61	14	Y	Unfiltered
GW00291GA	02/25/94	003	004	Y	Filtered TMAE
GW00291GA	02/25/94	21	05	Y	Unfiltered

Chemical data is still coming back from the labs so the above list is incomplete When all data is received a better indication of the success of the well re-development will be possible

3 Particle Fractionation Study Ed Moritz of Surface Water Division has collected a sample from 41691 to estimate particle size parameters for radionuclides in groundwater

4 Tabulation of offsite wells east of Indiana Street The State Engineers office was visited to determine the location of wells permitted with the State In addition contact was made with Wright Water Engineers to ascertain whether they had compiled data for offsite wells as part of some project they were working on So far Wright Water has not been able to add much information but they are still looking Visits were made to the farm house on the east side of Indiana Street but nobody has been home Efforts are continuing

5 Evaluation of stream sediment sampling Operable Unit (OU) 6 performed stream sediment sampling in and around the ponds along Walnut Creek Results from the sampling suggest Plutonium concentrations of approximately 1 pCi/g in and around the small pond near the Indiana Street boundary Since the well in question is near the creek, it is possible that some contribution of the contamination seen in the well is from historic releases in Walnut Creek

6 Evaluation of Surficial Soils Investigations Plutonium concentrations in surficial soils east of OU2 have been investigated by Iggy Litaor Isopleth maps for Plutonium in the area near well 41691 suggest that between 1 pCi/g and 3 pCi/g are ubiquitous in this area In addition, two soil trenches were dug and sampled along the east boundary in the general area of the well These analyses have been plotted, and show surficial soil concentrations of between 1 and 1 5 pCi/g in the upper 10 centimeters of the soil horizon Plutonium concentrations diminish to zero within 10 centimeters of the surface

7 Evaluation of Borehole samples from well 41691

Plutonium concentrations from sample intervals taken during drilling of 41691 were evaluated Sample BH00104EB taken from the 1 to 4 foot composite interval for the well shows a concentration of Plutonium of 2 3 pCi/g, which suggests that surficial radionuclide contamination was encountered

13

during drilling of the well

8 Request for boundary well chemical data from Colorado Department Of Health EG&G has requested that DOE officially request historic boundary well data from Colorado Department of Health This can be used to compare results The letter has been sent by DOE

bll

cc
W R Belcher
D N Brown
M S Buddy
N M Daugherty
P J Etchart
R C Henry
~~N A Helsteen~~
M E Levin
M Z Litaor
L G Manning
E C Mast
E J Moritz
M A Siders

13

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 17 40	GROUND ELEVATION (FT) 5643 95	PROJECT NUMBER SITEWIDE	LOG OF BORING NUMBER
NORTH	753470	AREA SITEWIDE	CASING DIAMETER (IN) 2 0	GEOLOGIST F G	41691 14
EAST	2093851	LOCATOR NUMBER U13	BOREHOLE DIAMETER (IN) 7 25	DATE DRILLED 11/08/91	

REMARKS Drilling Equipment Hollow Stem Auger Rotary Core ASI Geologist Fred Grigsby, EBASCO Geologist R T Canon

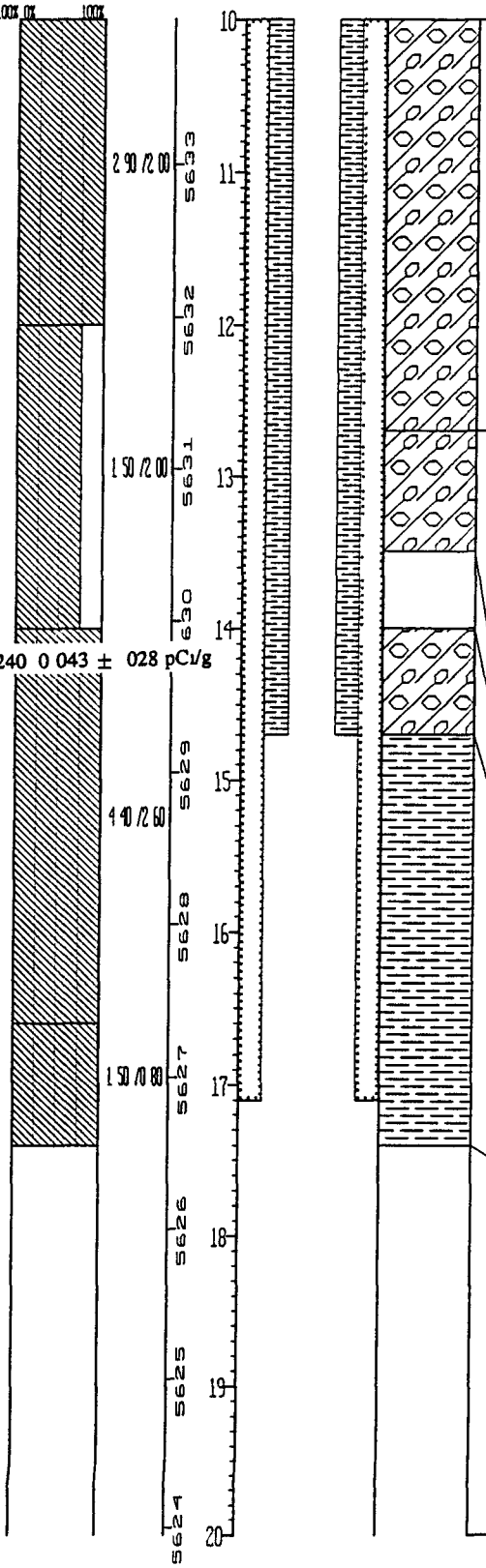
CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				1 60 /2 00	5643	0–1			SC	Clayey Sand with some Silt and Gravel Pred dark yellowish brown (10 YR 4/2), slightly calcareous Topsoil, good root development Gravel pred quartzite, max pebble size 1 5 in , sub-rounded to sub-angular Sand well graded, c g fraction sub-angular quartz, quartzite, feldspar, and misc rock fragments Finer fraction sub-angular to sub-rounded quartz, some feldspar, trace mica Sample dry, weathered, med to low plasticity 18% gravel, 34% sand, 22% silt, 26% clay
	EH00102B									
	EH00104B	Plutonium 239/240 2 3 ± 35 pCi/g								
					56	2			ML	Sandy Silt with some Clay Pale yellowish brown (10 YR 6/2) Poorly graded, calcareous Trace Fe staining Sand pred sub-angular to sub-rounded quartz, some feldspar Low plasticity, sample dry, weathered 36% sand, 38% silt, 26% clay
					5641	3			NO SAMPLE	No recovery
	EH00106B								ML	Sandy Silt with some Clay Same as above (reference interval 0 9' to 1 6')
				1 80 /4 00	5640	4			CL	Silty Clay with some Sand Grayish brown (5 YR 3/2) to dark yellowish brown (10 YR 4/2) Poorly graded, med plasticity Sand pred f g , sub-angular quartz Some feldspar and dark mineralization Sample dry, weathered, slightly calcareous Trace Fe Trace carbon 23% sand, 38% silt, 39% clay
					5639	5			NO SAMPLE	No recovery, lost core
					5638	6			CL	Silty Clay with some Sand Same as above (reference interval 3 0' to 3 8')
					5637	7			SM	Gravelly Sand with some Silt and Clay Mod yellowish brown (10 YR 5/4) to dark yellowish brown (10 YR 4/2) Poorly graded Med to low plasticity Gravel pred quartzite, pebble at 2 25 in , avg size approx 1 in , sub-rounded to sub-angular Sand f g , sub-angular to sub-rounded, pred quartz Interval appears to have mod to high permeability Damp, slightly weathered, non-calcareous (sm-sc) 20% gravel, 60% sand, 10% silt, 10% clay
	EH00108B			1 70 /4 00	5636	8				
	EH00107B	Plutonium 239/240 0 26 ± 068 pCi/g							NO SAMPLE	No recovery, lost core
	EH00108B				5635	9				
					5634	10				

14

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 17 40	GROUND ELEVATION (FT) 5643 95	PROJECT NUMBER	SITEWIDE	LOG OF BORING NUMBER
NORTH	753470	AREA SITEWIDE	CASING DIAMETER (IN) 2 0	GEOLOGIST	F G	41691 15
EAST	2093851	LOCATOR NUMBER U13	BOREHOLE DIAMETER (IN) 7 25	DATE DRILLED	11/08/91	

REMARKS Drilling Equipment Hollow Stem Auger, Rotary Core ASI Geologist Fred Grigsby, EBASCO Geologist R T Canon

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH / SAMPLE NUMBER / SAMPLE GRAIN SIZE (0% 50% 100%) / PERCENT RECOVERY (0% 100%) / RECOVERY/INTERVAL / DATUM (FT) / DEPTH (FT) / WELL OR PIEZOMETER CONSTRUCTION / LITHOLOGY / UNIFIED SOILS CLASSIFICATION OR ROCK TYPE / DESCRIPTION

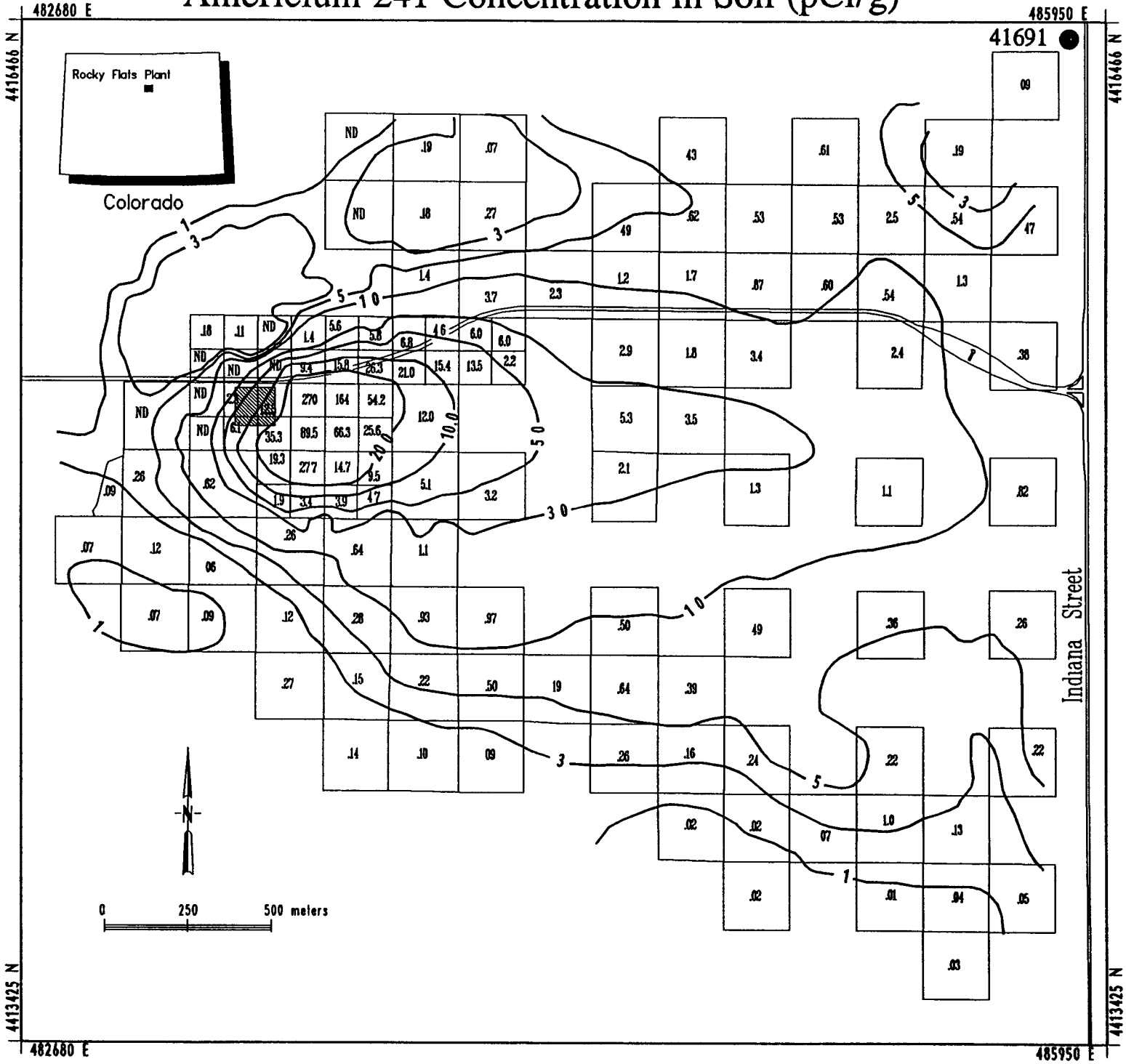


Sample number	Unified soils classification or rock type	Description
	GC	Clayey Gravel Matrix dark yellowish brown (10 YR 4/2) with some mod yellowish brown (10 YR 5/4) mottling Poorly graded Gravel pred quartzites, max pebble size to 2 0+ in Some scattered hematite nodules Some dark gray (N3) staining and mottling Sample damp, weathered, med plasticity (very sticky) 55% gravel, 45% clay
	GC	Sandy Gravel with some Clay and trace Silt Mod yellowish brown (10 YR 5/4), with dark yellowish orange (10 YR 6/6) and dark gray (N3) mottling Gravel pred quartzite, one pebble to 2 25 in, avg size approx 1 0 in, sub-angular Sand f g, pred quartz, sub-angular to sub-rounded Upper half of interval moist, lower half damp Med to low plasticity, sample weathered 55% gravel, 23% sand, 4% silt, 18% clay
BH00109EB	NO SAMPLE	No recovery, lost core
	GC	Sandy Gravel with some Clay and trace Silt Same as above (reference interval 12 7' to 13 5')
BH00110EB	CLAYSTONE	Top of Bedrock at 14 7' Claystone with some Silt Grayish orange (10 YR 7/4) and very pale orange (10 YR 8/2) grading to yellowish gray (5 Y 7/2) Interbedded claystones with some silt Gradational - no sharp contacts Core damp, mod indurated to sticky in very clayey intervals Slightly friable No apparent bedding of fracture Entire interval badly broken (drilling induced) <15% silt, >85% clay NOTE 1 5' of excess core recovery in interval frome 14 0' to 17 4'
		Total Drilled Depth = 17 4' NOTE Total Depth of Casing = 17 1' Bottom Depth of Filter Pack = 17 4' Backfill = None

Plutonium 239/240 0 043 ± 028 pCi/g

15

Americium 241 Concentration in Soil (pCi/g)



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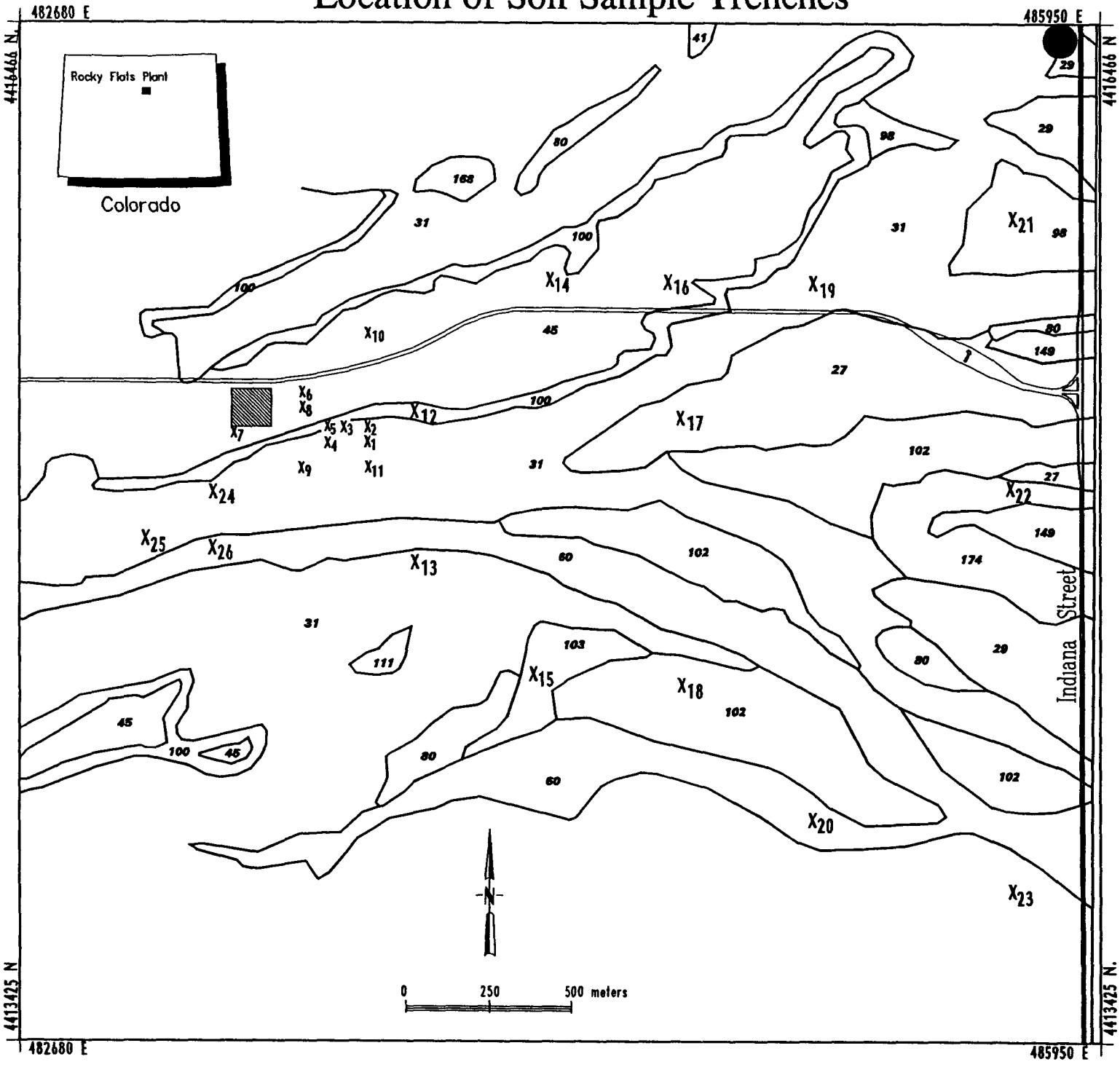
16

Location of Soil Sample Trenches



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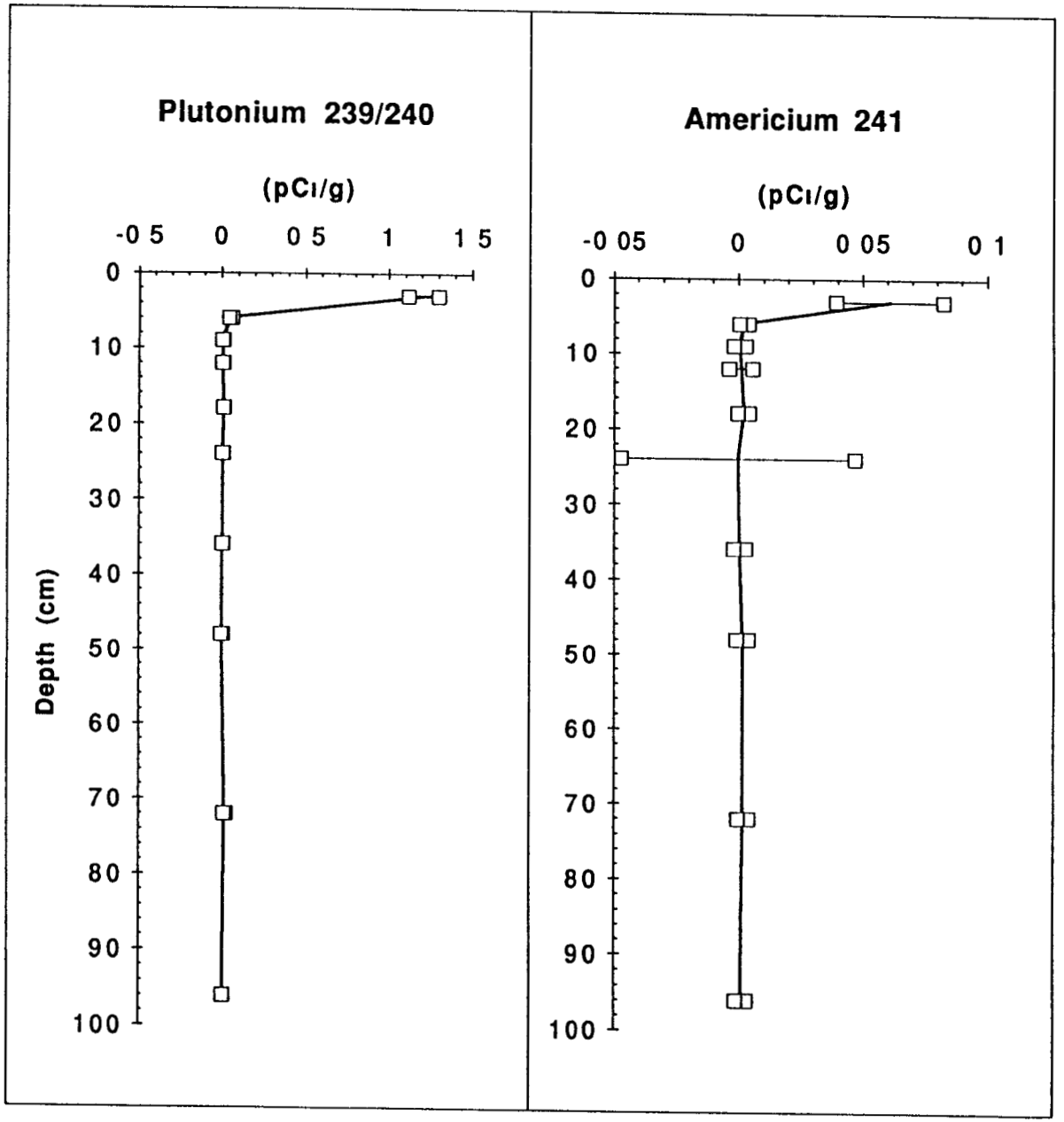
17

Location 21



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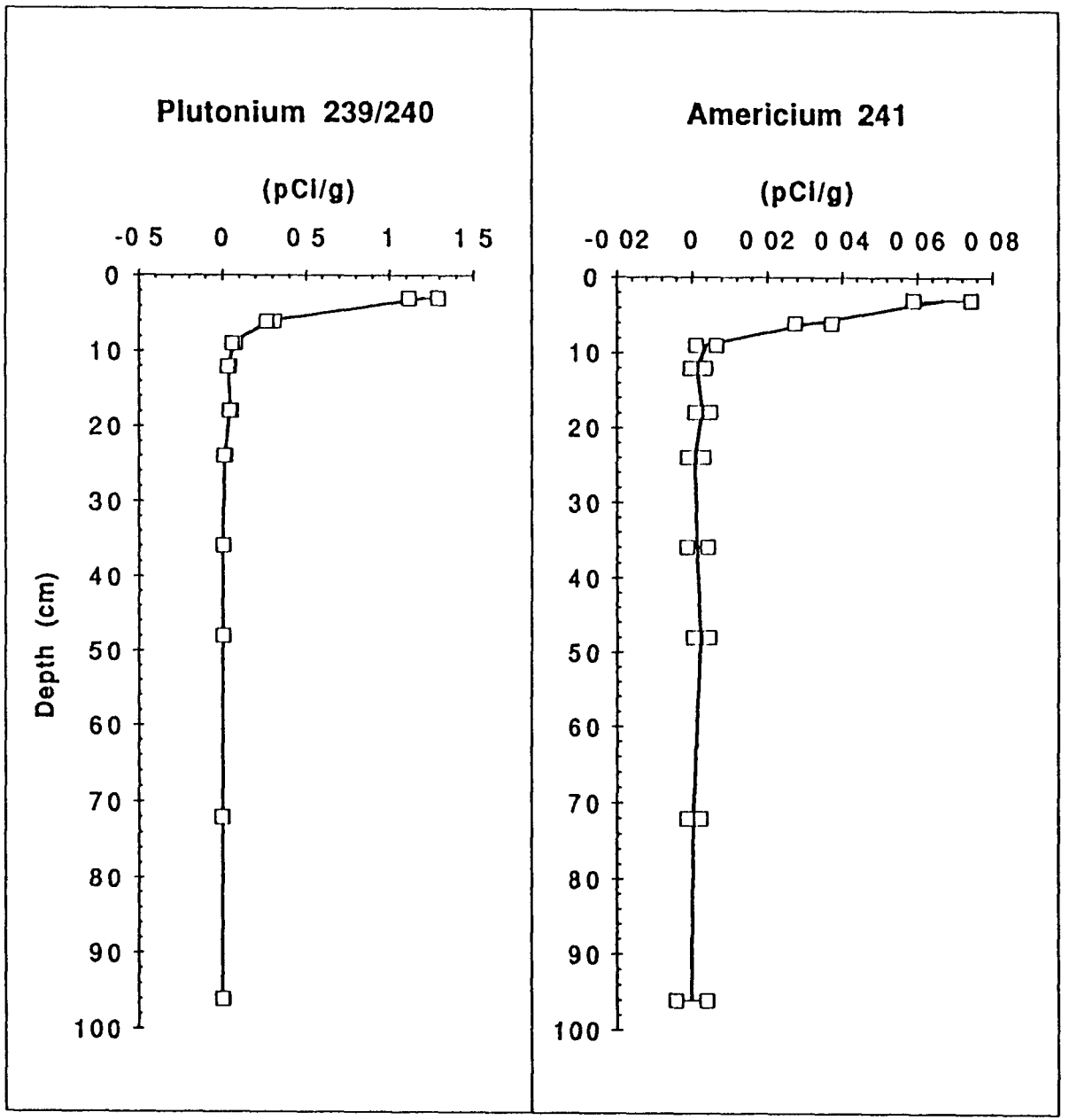
Location 22



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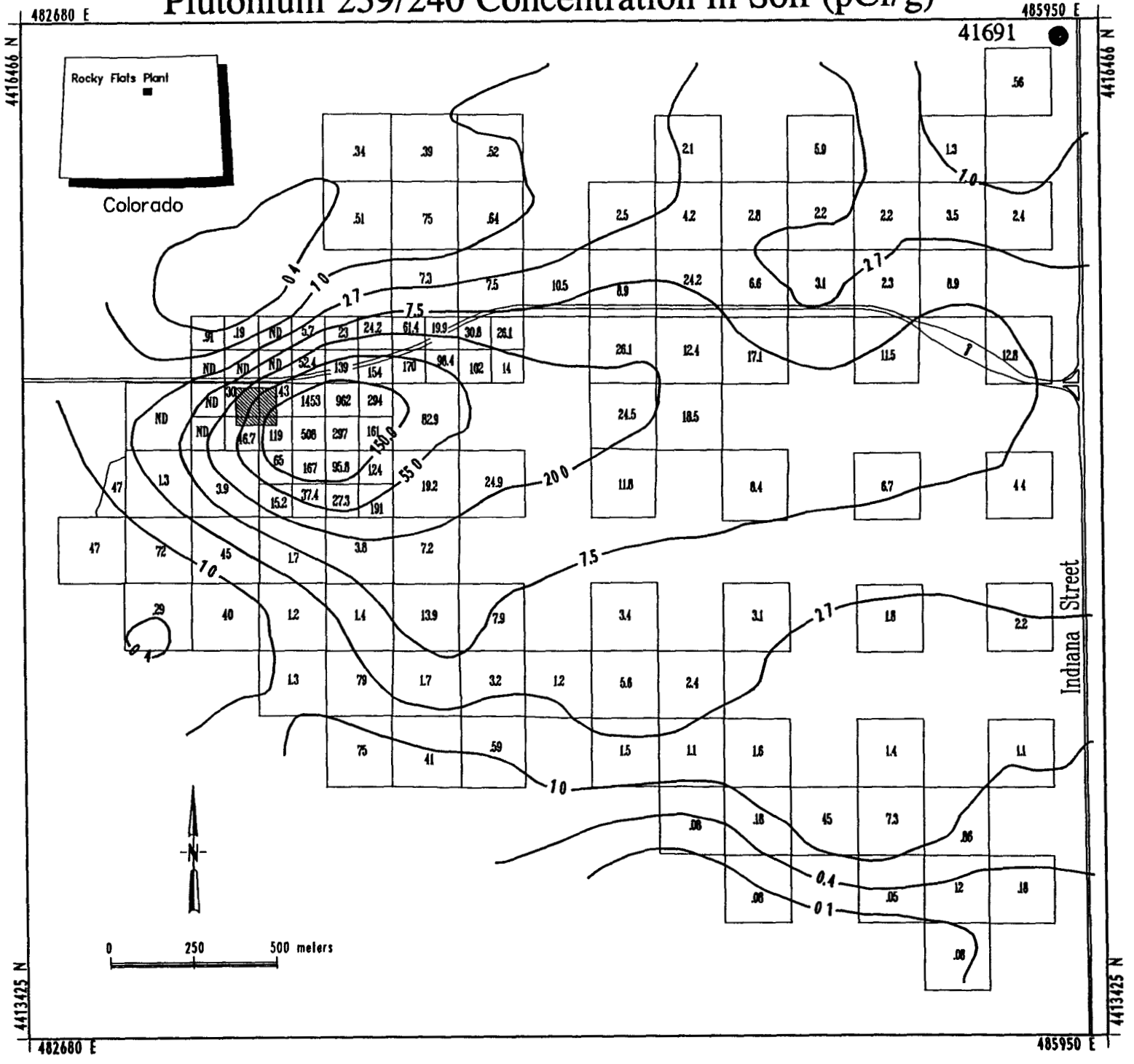
19 Figure 4

Plutonium 239/240 Concentration in Soil (pCi/g)



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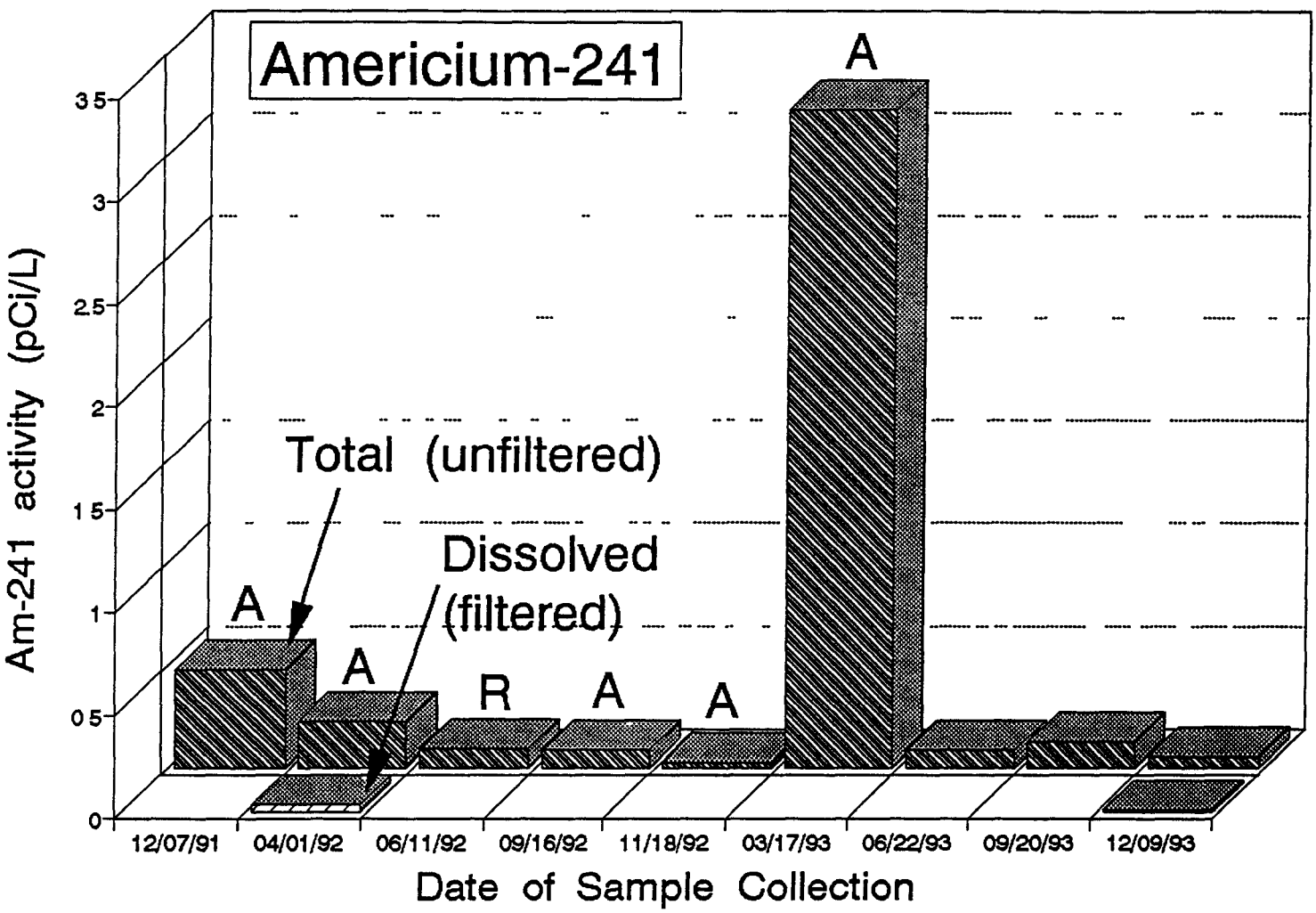
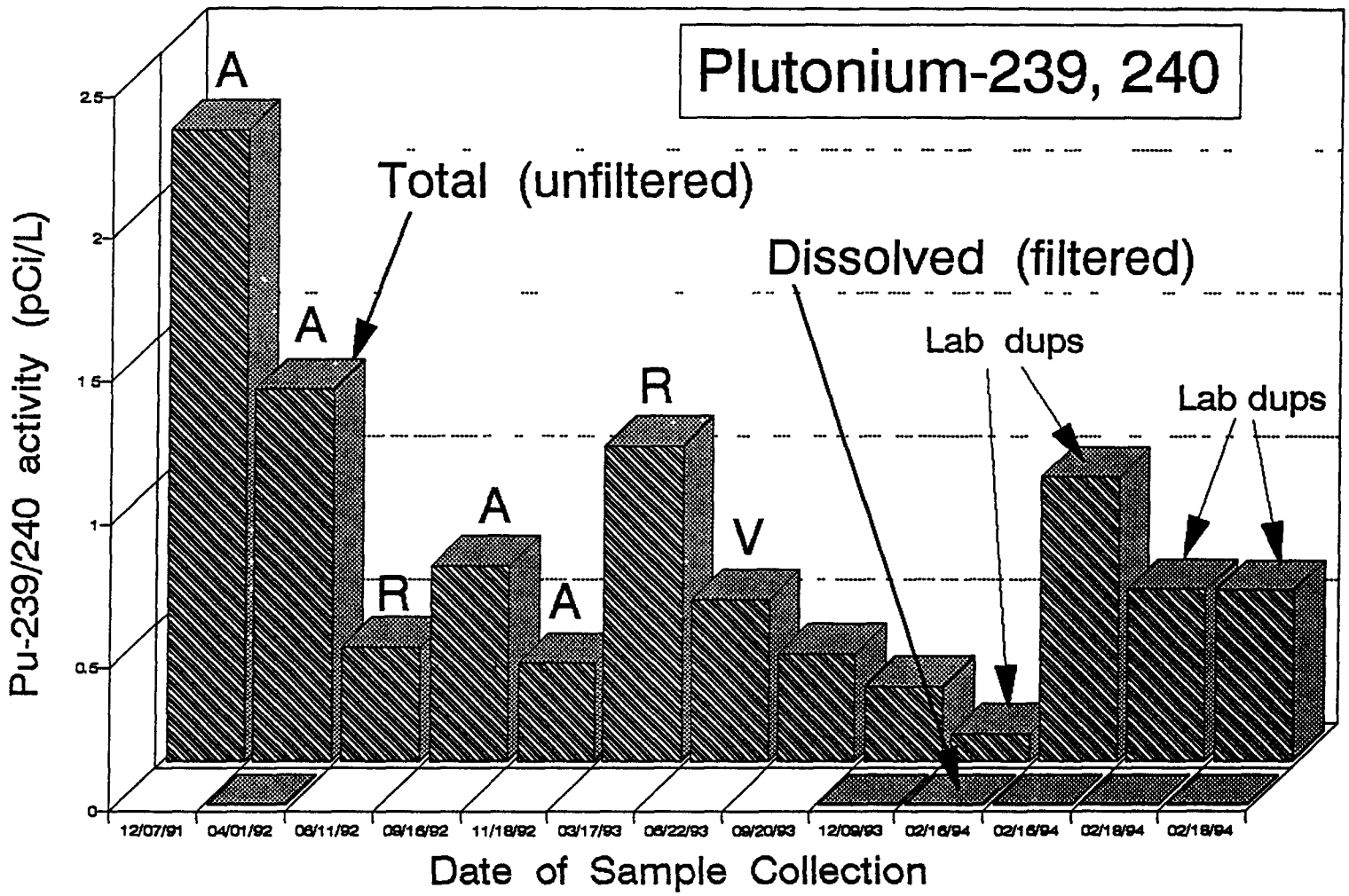
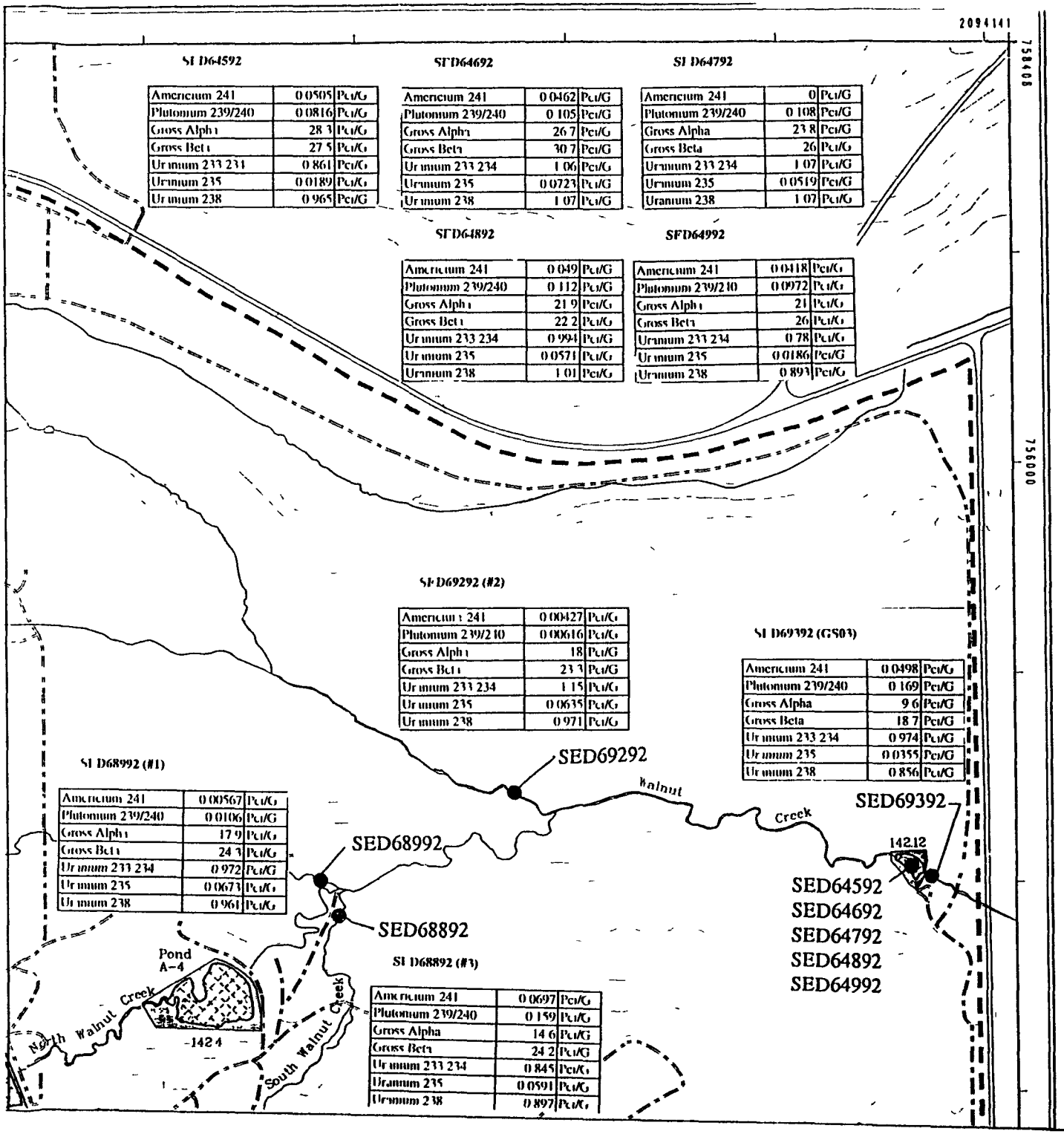
Am-241 Activity in Groundwater from Well 41691



Pu-239/240 Activity in Groundwater from Well 41691





SED64592

Americium 241	0.0505	Pci/G
Plutonium 239/240	0.0816	Pci/G
Gross Alpha	28.3	Pci/G
Gross Beta	27.5	Pci/G
Uranium 233 234	0.861	Pci/G
Uranium 235	0.0189	Pci/G
Uranium 238	0.965	Pci/G

SED64692

Americium 241	0.0462	Pci/G
Plutonium 239/240	0.105	Pci/G
Gross Alpha	26.7	Pci/G
Gross Beta	30.7	Pci/G
Uranium 233 234	1.06	Pci/G
Uranium 235	0.0723	Pci/G
Uranium 238	1.07	Pci/G

SED64792

Americium 241	0	Pci/G
Plutonium 239/240	0.108	Pci/G
Gross Alpha	23.8	Pci/G
Gross Beta	26	Pci/G
Uranium 233 234	1.07	Pci/G
Uranium 235	0.0519	Pci/G
Uranium 238	1.07	Pci/G

SED64892

Americium 241	0.049	Pci/G
Plutonium 239/240	0.112	Pci/G
Gross Alpha	21.9	Pci/G
Gross Beta	22.2	Pci/G
Uranium 233 234	0.994	Pci/G
Uranium 235	0.0571	Pci/G
Uranium 238	1.01	Pci/G

SED64992

Americium 241	0.0418	Pci/G
Plutonium 239/240	0.0972	Pci/G
Gross Alpha	21	Pci/G
Gross Beta	26	Pci/G
Uranium 233 234	0.78	Pci/G
Uranium 235	0.0186	Pci/G
Uranium 238	0.893	Pci/G

SED69292 (#2)

Americium 241	0.00427	Pci/G
Plutonium 239/240	0.00616	Pci/G
Gross Alpha	18	Pci/G
Gross Beta	23.3	Pci/G
Uranium 233 234	1.15	Pci/G
Uranium 235	0.0635	Pci/G
Uranium 238	0.971	Pci/G

SED69392 (GS03)

Americium 241	0.0498	Pci/G
Plutonium 239/240	0.169	Pci/G
Gross Alpha	9.6	Pci/G
Gross Beta	18.7	Pci/G
Uranium 233 234	0.974	Pci/G
Uranium 235	0.0355	Pci/G
Uranium 238	0.856	Pci/G

SED68992 (#1)

Americium 241	0.00567	Pci/G
Plutonium 239/240	0.0106	Pci/G
Gross Alpha	17.9	Pci/G
Gross Beta	24.3	Pci/G
Uranium 233 234	0.972	Pci/G
Uranium 235	0.0673	Pci/G
Uranium 238	0.961	Pci/G

SED68892 (#3)

Americium 241	0.0697	Pci/G
Plutonium 239/240	0.159	Pci/G
Gross Alpha	14.6	Pci/G
Gross Beta	24.2	Pci/G
Uranium 233 234	0.845	Pci/G
Uranium 235	0.0591	Pci/G
Uranium 238	0.897	Pci/G

U.S. Department

Rocky Flats

Individual Ha
Substance S
Operable

- Paved roads
- Unimproved dirt ro
- Streams, ditches, other drainage feat
- Individual Hazardo
- Rocky Flats Plant
- Ponds/lakes
- Buildings or structu
- Operable Unit

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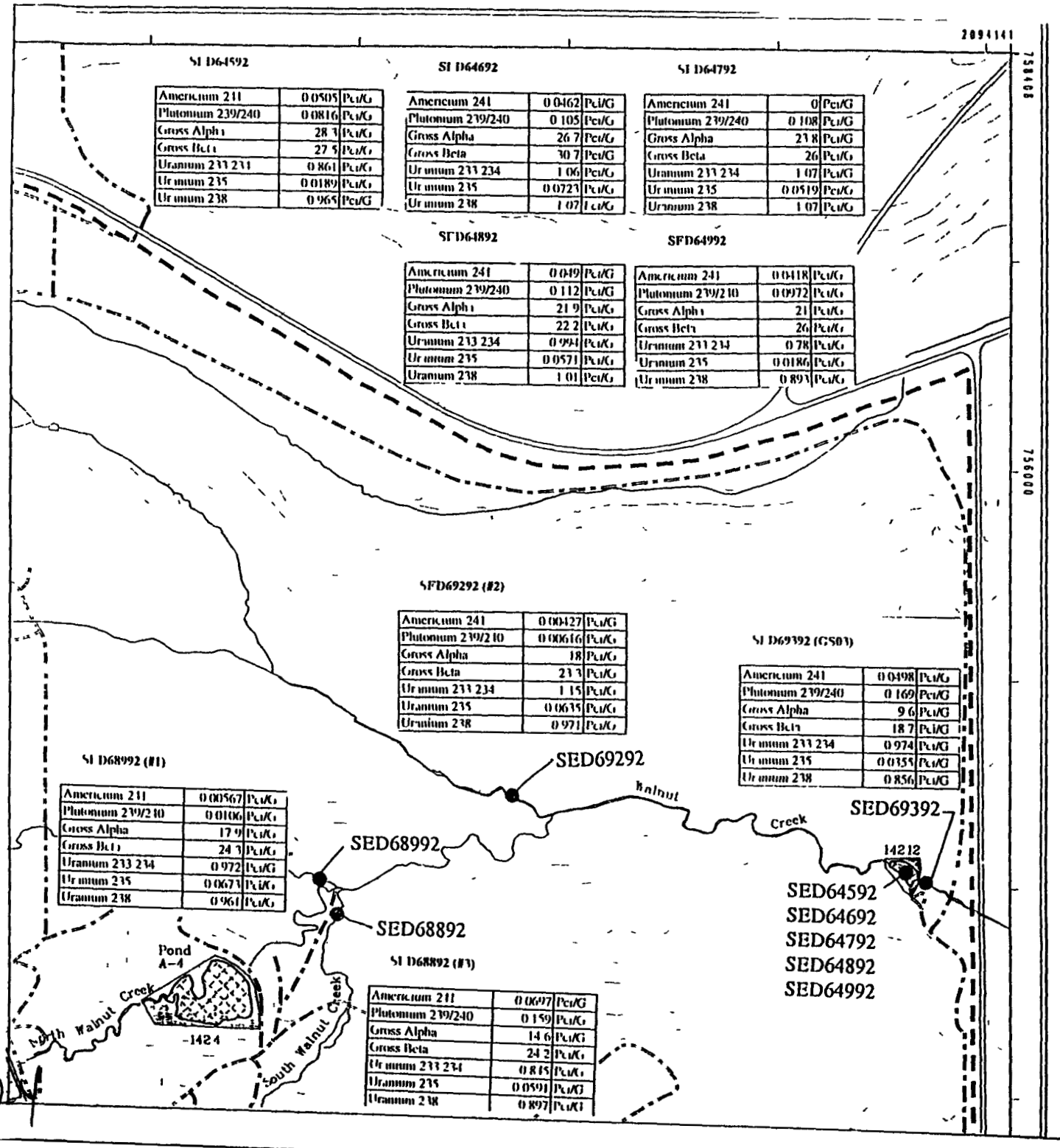

SI D64592

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Uranium 233 234	1.15	Pci/G
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Uranium 238	0.971	Pci/G

SI D69392 (GS03)

Americium 241	0.0498	Pci/G
Plutonium 239/240	0.169	Pci/G
Gross Alpha	9.6	Pci/G
Gross Beta	18.7	Pci/G
Uranium 233 234	0.974	Pci/G
Uranium 235	0.0355	Pci/G
Uranium 238	0.856	Pci/G

SI D68992 (#1)

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Plutonium 239/240	0.0106	Pci/G
Gross Alpha	17.9	Pci/G
Gross Beta	24.3	Pci/G
Uranium 233 234	0.972	Pci/G
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24/24

24 of 24